Mu'tah University
Deanship of the Graduate Studies

Factors Influencing the Successful Adoption of Decision Support Systems: The Context of Aqaba Special Economic Zone Authority

By

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الآراء الواردة في الرّسالة الجامعيّة لا تعبر بالضرورة عن وجهة نظر جامعة مؤتة

Dedication

This work is dedicated to my great parents, “the most special persons in my life”. To my brothers and sisters, who have encouraged, motivated and inspired me to accomplish this work.

Malek Bakhit Eleyan

Acknowledgement

All Praise is due to Allah, and peace and blessings be upon his Prophet Muhammad. I thank Allah for blessing me with the ability and the endurance to successfully complete this research. Without his assistance I would never have been able to complete it.

I would like to sincerely thank my supervisor, Dr. Fairouz Al-Dhmour, for her patience, encouragement, assistance and attention to this thesis.

My sincerest appreciation also goes to: Dr. Faisal Al- Shawareh, Dr. Ra'id AL-Adaileh and Dr. Khalid Al-Zo'bi for willingly accepting to evaluate my thesis and participate in the examination committee.

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Malek Bakhit Eleyan

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List of Abbreviations

ASEZA	Aqaba Special Economic Zone Authority
CBIS	Computer-Based Information Systems
DBMS	Database Management System
df	Degree of Freedom
DSS	Decision Support System
ERP	Enterprise Resource Planning
FDSS	Forecasting Decision Support System
GIS	Geographic Information System
HRD	Human resources Development
IDT	Innovation Diffusion Theory
IS	Information System
IT	Information Technology
MIS	Management Information System
MMS	Model Management Software
MS	Management Style
OS	Organization Structure
PEOU	Perceived Ease of Use
PTTF	perceived Task–Technology Fit
PU	Perceived Usefulness
SD	Standard Deviation
SDSS	Special Decision Support System
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
TMS	Top Management Support
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
USAID	U.S Agency for International Development
VIF	Variation Inflation Factor

Abstract

Factors Influencing The Successful Adoption of Decision Support Systems
"The Context of Aqaba Special Economic Zone Authority"

Malek Bakhit Eleyan

Mu'tah University, 2011

This study is concerned with examining the main factors that influence the successful adoption of Decision Support Systems (DSS) in the Aqaba Special Economic Zone Authority (ASEZA).

To achieve this aim the researcher investigated a set of factors: First, the System Characteristics (Perceived Ease of Use (PEOU) and Perceived usefulness (PU)). Second, Technical Aspects (information technology infrastructure and information systems interoperability). Finally, Organizational Aspects (top management support (TMS), management style (MS), and organizational structure (OS)).

A questionnaire was developed and distributed to a sample of (161) respondents to collect primary data, and based on a convenience sample the response rate was about 79%. Furthermore, the findings were analyzed using the Statistical Package for Social Software (SPSS), with an R^2 of 35.3%, linear Multiple Regression analysis revealed that all research variables have significant effect on successful adoption of DSS.

The results indicated that PU and IT infrastructures have a positive and significant influence on the successful adoption of DSS. Whereas, PEOU, IS interoperability, TMS, MS, and OS have no significant influence on the successful adoption of DSS. Finally, the findings indicated that no significant statistical differences existed between respondents' perceptions towards DSS adoption in terms of their demographic characteristics.

Based on the research findings and conclusions, a number of recommendations and future research suggestions are proposed.

الملخص

العوامل المؤثرة على نجاح تبني نظام دعم القرار
" سلطة منطقة العقبة الاقتصادية الخاصة "

مالك بخيت عليان

جامعة مؤتة، 2011

يهدف البحث إلى التعرف على اهم العوامل المؤثرة على نجاح تبني نظام دعم القرار(DSS) في سلطة منطقة العقبة الاقتصادية الخاصة (ASEZA)، حيث تم اختبار مجموعة من العوامل والمتمثلة في (1) خصائص النظام (سهولة استخدام النظام وأهمية النظام). (2): الجوانب التقنية (البنية التحية لتكنولوجيا المعلومات وتكامل عمل الأنظمة). (3): الجوانب التنظيمية (دعم الإدارة العليا، النمط الإداري، الهيكل التنظيمي).

ولغرض تحقيق اهداف البحث فقد تم تصميم استبانه وتوزيعها على أفراد العينة البالغ عددهم (161) مستجيب بهدف جمع البيانات الأولية، وبلغ معدل الاستجابة 79%، وذلك بالاعتماد على المعاينة الملائمة. ولاختبار الفرضيات فقد تم استخدام الرزمة الإحصائية للعلوم الاجتماعية (SPSS), ومن خلال استخدام اسلوب الانحدار المتعدد فقد كانت R^2 = 35.3% مما يدل على وجود اثر هام ذو دلالة احصائية للعوامل المؤثرة في نجاح تبني نظام دعم القرار(DSS).

أشارت النتائج إلى أن أهمية النظام والبنية التحتية لتكنولوجيا المعلومات لها تأثير ايجابي وذو دلالة احصائية على نجاح تبني نظام دعم القرار(DSS) في مجتمع الدراسة، بينما سهولة استخدام النظام، تكامل عمل الأنظمة، دعم الإدارة العليا، النمط الإداري، الهيكل التنظيمي ليس لها أي أثر على نجاح تبني نظام دعم القرار(DSS). وأشارت ايضا إلى عدم وجود فروقات ذات دلالة إحصائية بين تصورات المبحوثين لتبني النظام طبقا للخصائص الديمغرافية. وبناءا على نتائج البحث قُدمت مجموعة من التوصيات العملية التي قد تعد مهمة لسلطة منطقة العقبة الاقتصادية الخاصة، كما قدمت بعض الاقتراحات لمجالات البحث المستقبلية.

Chapter One
Introduction

1.1 Research Background

The rapid changes in the business environment can push the need for technologies and their acceptance at an accelerating rate; organizations are becoming more flexible using various Information Systems (IS) to support more strategic and complex decisions in order to achieve competitive advantage. Information Technology (IT) is a facilitator of organizational activities and processes, and is also an assistive tool. It has been used to support managers in decisions which were developed depending on intuition and judgment of the decision makers. Many types of Computer-Based Information Systems (CBIS) have been developed to support decision making, including Decision Support Systems (DSS) (Nakmuang, 2004; Martin, Brown, Dehayes, Hoffer and Perkins, 2002; Turban, Rainer and Potter2001).

Decision making is considered one of the main activities within an organization, especially at management level. It is the process where decision makers decide on a course of action to follow in different situations. The success of a decision depends to some extent on the quality of the data on which they rely. Issues which depict good quality are for example completeness, update, accuracy, accessibility of the data and reliability (Beynon-Davies, 2002).

The first DSS were adopted by organizations around the world as far back as four decades ago. DSS can be described as "CBIS that help decision-makers to confront strategic problems through direct interaction with data and analysis models" (Mcnurlin and Sprague, 2004). DSS are designed to increase productivity, reduce cost, save time, increase the quality of decisions, achieve competitive edge, and attain the effectiveness and efficiency of the overall performance (Nokhbatol, Menhaj and Shafiee 2010; Turban, Aronson, Liang, and Sharda, 2007).

Therefore, the main aim of this research is to investigate a set of factors influencing the successful adoption of DSS within the context of Aqaba Special Economic Zone Authority (ASEZA). These factors are: First, the system characteristics (Perceived Ease of Use (PEOU), Perceived Usefulness (PU)). Second, technical aspects (IT Infrastructure, IS Interoperability). Finally, organizational aspects (Top Management Support (TMS), Management Style (MS), and Organization Structure (OS).

1.2 Research Problem and Questions

The problem of this research stems from detecting the factors that influence the successful adoption of DSS in the context of ASEZA, as there are many factors emphasizing the need to adopt DSS; such as technological development, competition and the desire to improve the work. This research attempts to answer the following main question: *"What are the main factors that influence the successful adoption of DSS in ASEZA"?*

To achieve the research's aim and objectives this main problem is divided into the following sub questions:

1. What is the impact of system characteristics on DSS's successful adoption?
2. What is the impact of technical aspects on DSS's successful adoption?
3. What is the impact of organizational aspects on DSS's successful adoption?
4. Are there differences in the respondent's perceptions toward adoption of DSS according to demographic characteristics within context of ASEZA?

1.3 Research Importance

The importance of this research can be derived from the following:

1. The lack of studies that focus on DSS in the Arab country, and particularly in Jordan. Therefore, this research may represent a starting point for further research to cover other factors affecting DSS adoption (which are not discussed in this research).
2. The magnitude of this research is obtained from the value of DSS which represents the ultimate investment of IT for ASEZA, which is considered one of the biggest private public integration entities in the area, due to its high costs, yet being considered as a new strategic technological and organizational tool in this empirical research of ASEZA.
3. The findings of this research will be useful not only for academics and business people, but also for ASEZA and any other organization's managers and decision makers.
4. This research is considered a pioneer study investigating a new and very important factor; the IS interoperability on DSS' successful adoption.

1.4 Research Aim and Objectives

The main aim of this research is to investigate the factors influencing the successful adoption of DSS within the context of ASEZA. To achieve this aim, the following objectives were proposed:

1. To examine the impact of system characteristics on the successful adoption of DSS in the context.
2. To examine the impact of technical aspects on the successful adoption of DSS in the context.
3. To examine the impact of organizational aspects on the successful adoption of DSS in the context.
4. To investigate whether there are differences in the respondent's perceptions toward adoption of DSS based on the demographic characteristics of ASEZA's managers (gender, age, commission, job description, education level, and experience).

1.5 Research Structure

This research is organized into five chapters as displayed in Figure (1.1), as follows:

Chapter One: **"Introduction".** The aim of this chapter is to provide a general background concerning the research subject, research problem and questions, research importance, research aim and objectives, and the structure of the research.

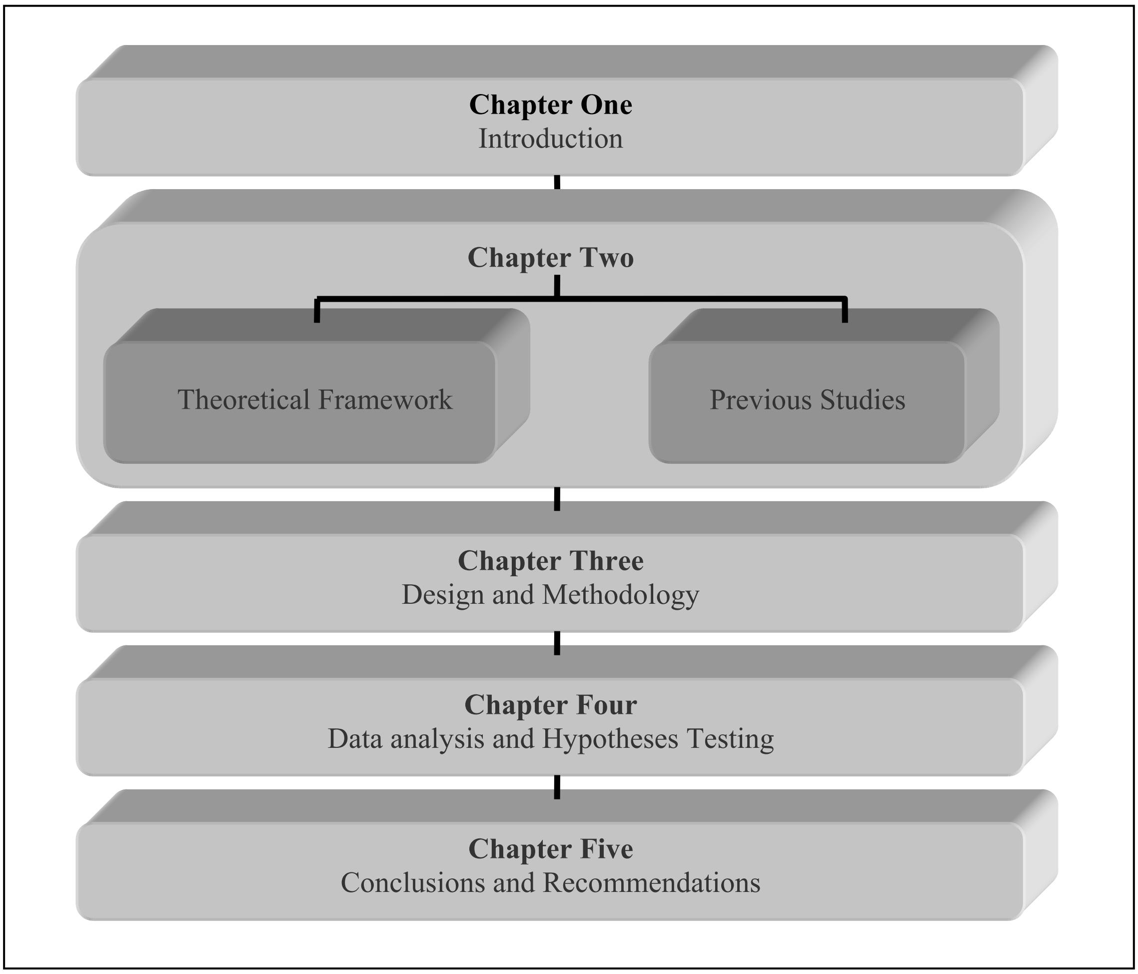
Chapter Two: "Theoretical Framework and Previous Studies". The aim of this chapter is to review the literature and previous studies related to DSS in order to identify the gaps in the literature that motivated this research, and present the research model along with the hypotheses.

Chapter Three: "Design and Methodology". The aim of this chapter is to discuss the research methodology that applied in this research, and display many elements; the research design, research approach, population and sample selection, data collection methods and instruments, variables measurement, analyses tools, instrument validation and reliability.

Chapter Four: "Data Analysis and Hypotheses Testing". The aim of this chapter is to present and analyze the data obtained from the use of questionnaires and test the hypotheses. The researcher studies sample characteristics, displays data descriptive analyses, tests the hypotheses, gives and interprets the results.

Chapter Five: "Conclusions and Recommendations". The aim of this chapter is to summarize the findings and to state conclusions. In addition, state the limitations and provide some recommendations for further research.

Figure (1.1)
Research Structure



Chapter Two
Theoretical Framework and Previous Studies

2.1 Introduction

This chapter is the theoretical base of the research area. First, it explains the concept of DSS; presents a brief description of DSS history, its components, characteristics, benefits and the adoption process. In addition, it reviews some Technology Acceptance Theories and Models. Second, it will highlight the previous studies concerning the focus of this research. Finally, the researcher demonstrates how to build the model and develops hypotheses.

2.2 Theoretical Framework

2.2.1 The Concept of DSS

In the early of 1970s, Scott-Morton first articulated the major concept of DSS, as “Interactive CBIS, which help decision makers, utilize data and models to solve unstructured problems” (Gorry and Scott-Morton, 1971: p.31). In addition, Klein and Methlie (1995) perceived DSS as a computer program that provides information in a given domain of application by means of analytical decision models and access to databases, in order to support a decision maker in making decisions effectively for complex tasks.

Based on the literature review the researcher decided to cover the concept of DSS through three main aspects; DSS components, characteristics and objectives as shown in Table (2.1) bellow:

Table (2.1)
The Concept of DSS

Aspects	Definitions	Sources
DSS Components	DSS is an organized collection of people, procedures, software, database, and devices used all interactively to enhance understanding and information base about options through the use of models and data processing and consequently supporting problem-specific decision making and problem solving.	Stair and Reynolds, (2010); Shim et al, (2002); Finlay, (1994).
DSS Characteristics	An umbrella term which covers any computerized system that can support an organization during its decision making processes with highly flexible and interactive IT systems that are designed to support decision making. DSS are tools to handle variety of applications of strategic problems confronting managers and operating within categorization of model and database oriented in order to help people make better decisions.	Haag et al, (2005); Wober and Gretzel, (2000); Fredrick, (1999); Wrenden, (1997).
DSS Objectives	Coupling the intellectual resources of individuals with the capabilities of the interactive CBIS to improve the quality of decisions and to investigate the relationships that exist within huge volumes of data, in order to aid in making better decisions while dealing with semi-structured and unstructured problems.	Turban et al, (2007); Mcnurlin and Sprague, (2004); Keen and Scott-Morton, (1978).

In general, structured problems are more prevalent at lower organizational levels, whereas semi-structured problems are more common at middle management level and unstructured problems at higher levels of the company. Laudon and Laudon (2010) have categorized the problems into two categories as the following:

1. **Unstructured problems:** are those in which the decision maker must provide judgment, evaluation, and insight to solve the problem each of these decisions is novel, important, and no-routine, and there is no well-understood or agreed-on procedure for making them.
2. **Structured problems,** by contrast, are repetitive and routine. They involve a definite procedure for handling the organizational problems so that they do not have to be traded each time as if they were new. Many decisions have elements of both types of decisions and are **semi-structured problems**, where only part of the problem has a clear-cut answer provided by an accepted procedure.

The researcher noticed in the previous definitions, DSS are designed to support the decision makers to solve the unstructured and semi-structured problems and based on an extensive review of DSS; the researcher provided the following definition:

"A DSS is a system that supports the managerial decisions making processes by assisting the organization in solving strategic issues".

2.2.2 Brief History of DSS

The history of DSS arguably began in 1965; some of the earliest beginnings of DSS are represented in Table (2.2) (Power, 2003). According to Keen and Scott-Morton (1978), the concept of decision support has evolved from two main areas of research: the theoretical studies of organizational decision making done at the Carnegie Institute of Technology early 1960s, and the technical work on interactive computer systems, mainly carried out at the Massachusetts Institute of technology in the 1960s. It is considered that the concept of DSS became an area of research of its own in the middle of the 1970s, before gaining in intensity during the 1980s. In the middle and late 1980s, executive IS, group DSS, and organizational DSS evolved from the single user and model-oriented DSS to its current position . At the Beginning of 1990s, data warehousing and on-line analytical processing began broadening the realm of DSS. As the turn of the millennium approached, new Web-based analytical applications were introduced.

Table (2.2)
A Brief History of DSS

Sources	Event
(1965) Peter Keen, Charles and Stabell	DSS evolve from "the theoretical studies of organizational decision-making".
(1970) Sprague and Watson.	Business journals publish articles about Management Decision Systems, Strategic Planning Systems, and Decision Systems.
(1971) Michael S, Scott Morton	Books were written about Management Decision Systems: Computer- Based Support for Decision Making.
(1970-1974) Richard Klass, and Charles Weiss	The first data-driven DSS was built using a Data Warehouse system.
(1974) Gordon Davis	Management Information Systems defined as "an integrated, man or machine system for providing information to support the operations, management, and decision-making functions in an organization."
(1975) J.D.C. Little	Brand aid was designed to support product, promotion, pricing, and advertising decisions.
(1978) Peter Keen , Michael and S. Scott Morton	DSS textbooks provided support for systems analysis, design, implementation, evaluation, and development.
(1980) Steven Alter	1. Doctoral dissertation results published in influential book. 2. Research and Papers expanded the framework for thinking about business and management of DSS.
(1981) Robert Bonczek, Clyde Holsapple and Andrew Whinston	Theoretical framework associated with designing knowledge-oriented DSS explained. Four components explained: a. A language system that specifies all messages that a specific DSS can accept. b. A presentation system for all messages a DSS can emit. c. A knowledge system for all knowledge a DSS has. d. A problem-processing system that is the "software engine" which tries to recognize and solve problems during the use of specific DSS.
(Late 1980s) Armstrong, Densham, and Rushton	Model-driven spatial DSS evolved.
(1990) Alavi and Joachimsthaler	Surveys and citation studies of models were taken to access the major applications for DSS.
(1995) Power, Bhargava and Quek	Web-based DSS started to evolve.

Source: (Power, 2003)

2.2.3 The Fundamental Components of DSS

The basic elements of DSS are database and model base. In addition, a typical DSS contains a dialogue manager, which allows decision makers to easily access and manipulate the DSS and to use common business terms and phrases. Finally, access to the internet, networks, and other CBIS permits the DSS to be linked into other powerful systems, including the transaction processing systems or function specific subsystems. Figure (2.1) shows a conceptual model of DSS (Stair and Reynolds, 2010; Turban et al, 2007; Druzdzel and Flynn, 2002). The following clarifies DSS components in details:

1. Database

A database is a collection of interrelated data, organized to meet the needs and structure of an organization that can be used by more than one person for more than one application. Database Management System (DBMS) allows managers and decision makers to perform qualitative analysis on the organizations vast stores of data in database and data warehouse. It can also connect to external databases to give managers and decision makers even more information and decision support. External database can include the internet, libraries, government database, and more. The combination of internal and external database access can give key decision makers a better understanding of the organization and its environment.

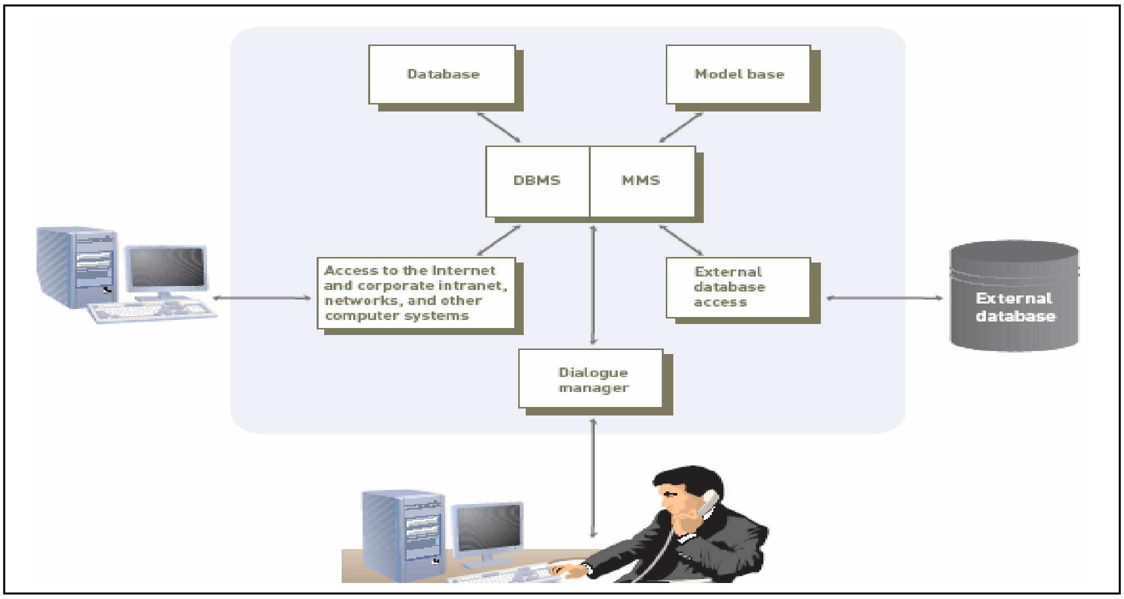
2. Model base

Model base is a part of DSS that provides decision makers access to a variety of models and assists them in decision making. Also It allows managers to perform quantitative analysis both internal and external data. Model Management Software (MMS) is software that coordinates the use of models in DSS, including financial, statistical analysis, graphical, and project management models.

3. Dialogue Manager

A user interface that allows decision makers to easily access and manipulate the DSS and to use common business terms and phrases, also allows users to interact with the DSS to obtain information.

Figure (2.1)
Conceptual Model of DSS



Source: (Stair and Reynolds, (2010): p.442)

According to Stair and Reynolds (2010); Turban et al, (2007) and Druzdzel and Flynn (2002) debates, the researcher concluded that in order to solve problems, DSS need data which can be revealed from different sources such as: databases. Data is the basic component of the DSS architecture as shown in (Figure 2.1). DBMS is needed to access the database and at the same time to update it. In addition, DSS includes models, such as statistical, mathematical and financial models, which can be standardized and customized in order to process the data. MMS coordinates and control the models which are being executed in DSS. Usually DSS have an easy user interface where the users can communicate with the system and at the same time have the possibility to include their own views and experiences.

The previous three components were strongly agreed upon by several studies. However other studies such as Power (2002) and Marakas (1999) who suggested taking a different path to the research of DSS components (Communications-driven DSS, Data-driven DSS, Document-driven DSS, Knowledge-driven DSS and Model-driven DSS). This path will not be considered due to incomparability.

2.2.4 The Characteristics of DSS

The key characteristics of DSS according to Turban et al, (2007) are:

1. Support for decision makers, mainly in semi-structured and unstructured situations, by bringing together human judgment and computerized information.

2. Support for interdependent and sequential decisions. The decisions may be made once, several times, or repeatedly.
3. Support in all phases of the decision-making process: intelligence, design, choice, and implementation.
4. Easy of use: User-friendliness, strong graphical capabilities, and an interactive natural language human-machine interface can greatly increase the effectiveness of DSS. Most new DSS applications use web-based interfaces.
5. Improvement of the effectiveness of decision making (e.g., accuracy, timeliness, quality) rather than its efficiency (e.g., the cost of making decision). When DSS are deployed, decision making often takes longer, but the decisions are better.
6. Finally DSS can be employed as a standalone tool used by an individual decision maker in one location or distributed throughout an organization and in several organizations along the supply chain. It can be integrated with other DSS and applications, and it can be distributed internally and externally, using networking and web technologies.

2.2.5 The Benefits of the DSS

The benefits of a good DSS are to get better decisions and more effective decision making process or ultimately both. Better decisions can be reached through: providing alternatives and information; experience of users, and communication networks. Once these decisions are reached they will be managing the resources more efficiently, reducing the costs, increasing the profits, and improving customer service.

These points have come to agree with a study by Pick (2008) in which he concluded that better decisions once implemented, result in managing the resources more efficiently, minimizing the costs and the risks, increasing the profits and improving customer service. These benefits can have an effect of greater reliability which indirectly depicts the way the decision process is enhanced and improved. Also another positive effect which comes along with the use of DSS is that it can increase the user's confidence in the decisions made and also enhance their understanding of different problems and not to replace the decision-maker but instead to improve and enhance the decision process (Pick, 2008; Alavi and Henderson, 1981).

2.2.6 Adoption of DSS

Many organizations continue to invest large amounts of resources in new IT, and determining the potential acceptance of these new technologies is important (Chau, 1996). If the new IT is accepted and adopted by users, the chances of the system and investments` success greatly increase (Behrens et al, 2005).

Rogers (1995) defined the adoption as: "A decision to make full use of an innovation as the best course of action, whereas rejection is a decision not to adopt an available innovation".

Adoption is applied through a process which concerns a sequence of stages that a potential adopter of an innovation passes through before acceptance of a new system. Rogers (1995: p.21) defines the adoption process as:

"The process through which an individual or other decision-making unit passes from first knowledge of an innovation, forming an attitude towards the innovation, to a decision to adopt or reject the implementation of the new idea, and to confirm this decision".

Premkumar and Roberts (1999) agreed with Rogers (1995) as they considered five phases in the adoption process: Awareness stage of acquiring information about the innovation, persuasion stage of being persuaded to adopt the innovation, decision stage of deciding to adopt, implementation stage of implementing the innovation and using it and finally confirmation stage of evaluating the actual outcomes with expectations, these were clarifie in the Figure (2.2) in Section (2.3.1.1) (Innovation Diffusion Theory).

Many studies examined the acceptance and the adoption of DSS like (Hart and Jaques, 2005; Hart and Porter, 2004; and Hart et al, 2002). The need for businesses to adopt new system is the anticipated benefits from this system that would be brought to the organization. If users are not willing to accept the IS, it will not provide full benefits to the organization (Davis and Venkatesh, 1996). In this research, it is proposed that there are several factors influencing the successful adoption of DSS for ASEZA.

In light of what mentioned above, the researcher defines the adoption of DSS process as:

"The process of knowing DSS (Awareness stage) and being convinced to DSS (Persuasion stage), deciding to adopt DSS (Decision stage), applying its work standards and regulations (Implementation stage), and the willingness to invest in the IT infrastructure for better decisions of ASEZA and the anticipated benefits from it (Confirmation).

Based on Rogers (1995), the researcher concluded that the context of ASEZA has passed the first three stages of (Awareness, Persuasion, and Decision). Since the research is interested in the investigation of DSS adoption, two main system characteristics derived from the TAM Model are used as independent variables which are the PEOU and PU which affect the adoption of DSS; this Model (TAM) will be discussed in the next section.

2.3 Technology Acceptance Theories and Models

User acceptance of technology has been an important area of research, with growing technology needs in the 1970s and increasing failures of system adoption in organizations, predicting system use became an area of interest for many researchers. However, most of the studies carried out failed to produce reliable measures that could explain system acceptance or rejection (Davis, 1989). A wide variety of theoretical perspectives has been developed in order to understand how users make decisions to use technology applications.

Probably the most dominant theories in IT research are Innovation Diffusion Theory (IDT) (Rogers, 1995), Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975), Theory of Planned Behavior (TPB) (Ajzen, 1991), and the Technology Acceptance Model (TAM) (Davis, 1989). These theories provide tools to understand success or failure in implementation processes of new IT applications (Koivunen, 2009).

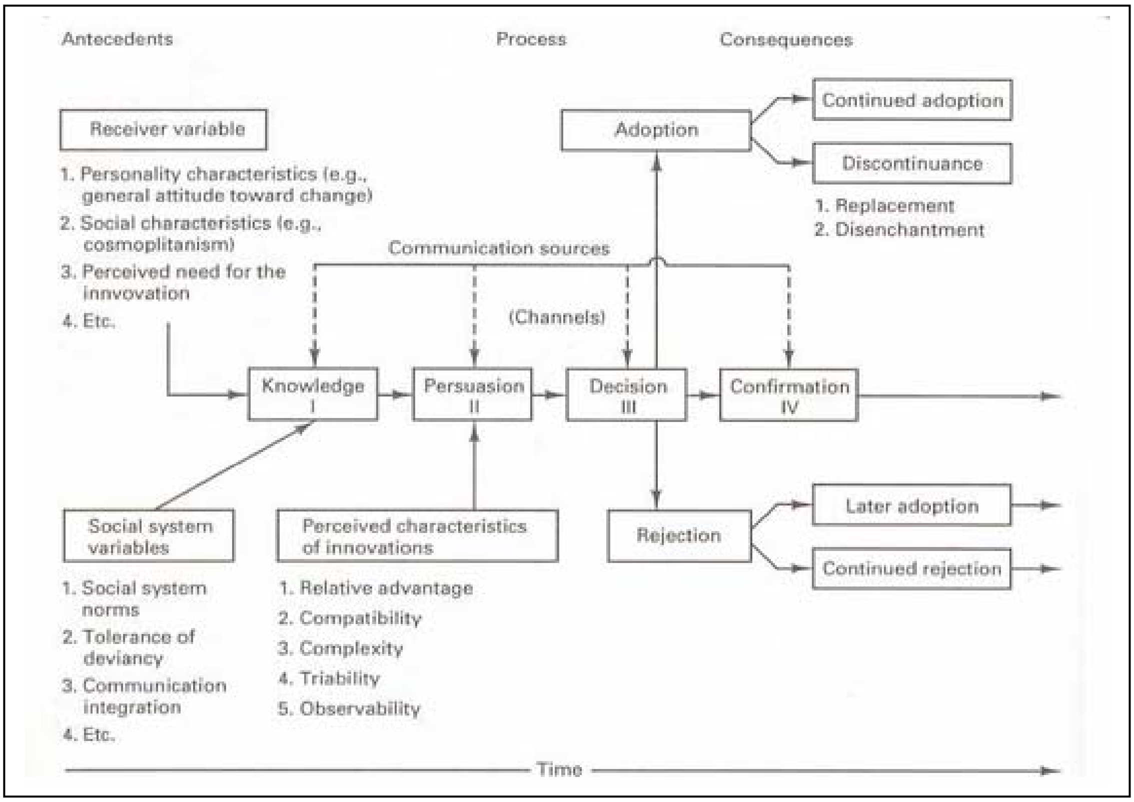
In this regard, at this section the researcher reviews and discusses the literature in relation to three prominent technology acceptance theories and models, they include: IDT, TRA, TPB, and TAM.

2.3.1 Theories of Behavior

2.3.1.1 Innovation Diffusion Theory (IDT)

Innovation diffusion theory explains the event of the innovation decision process that determines the rate of adoption in various categories of adopters. The theory is concerned with the manner in which a new technological idea or technique migrates from the stage of creation to widespread use. The theory suggests that individuals can be classified according to degree of innovativeness which is defined as relative speed of adoption of the innovation. There are five categories of adopter based on the degree of innovativeness which are innovators, early adopters, early majority, late majority and laggards. IDT also presume five innovation characteristics that affect the diffusion: relative advantage, compatibility, complexity, trialability and observability (Rogers, 1995) as demonstrated in the Figure (2.2) bellow which is discussed before in Section (2.2.6) regarding the adoption process stages including (Knowledge, persuasion decision, confirmation).

Figure (2.2)
Innovation Diffusion Theory



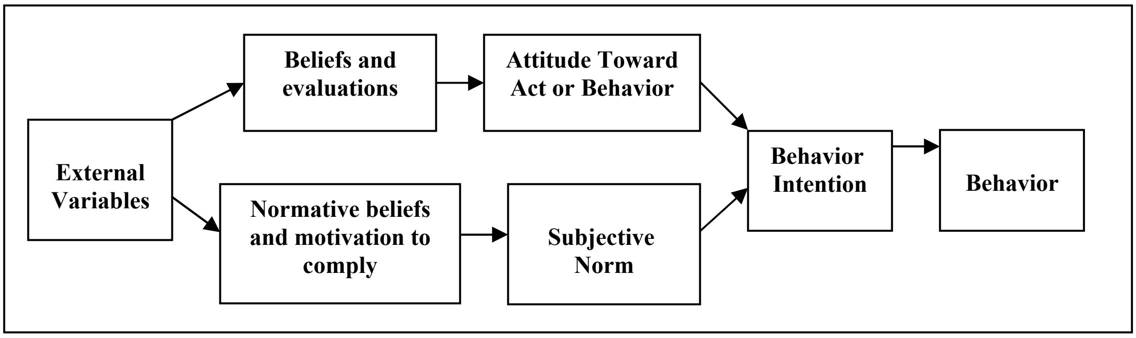
Source: (Rogers, 1995)

2.3.1.2 Theory of Reasoned Action (TRA)

Theory of reasoned action was introduced by Fishbein and Ajzen (1975) in order to understand behavioral intention. In TRA, the behavior intention of performing a particular behavior is determined by a personal factor and a social factor (Fishbein and Ajzen, 1975).

The personal factor is represented by attitude towards the behavior, which is "an individual's positive or negative feeling". The social factor is represented by subjective norm, which describes "the person's perception that most people who are important to him think he should or should not perform the behavior in question". Furthermore, according to the expectancy value model of attitude (Fishbein and Ajzen, 1975) an individual's attitude towards performing the target behavior is itself determined by his or her beliefs regarding the consequences of performing the target behavior, as well as the evaluation of these consequences. Likewise, an individual's subjective norm is the by-product of his or her normative beliefs and motivation to comply. Figure (2.3) depicts a graphical representation of TRA, which illustrates that external variables i.e. personality, demographics, etc. do not have a direct influence on target behavior, but, rather, are mediated by the TRA model.

Figure (2.3)
Theory of Reasoned Action

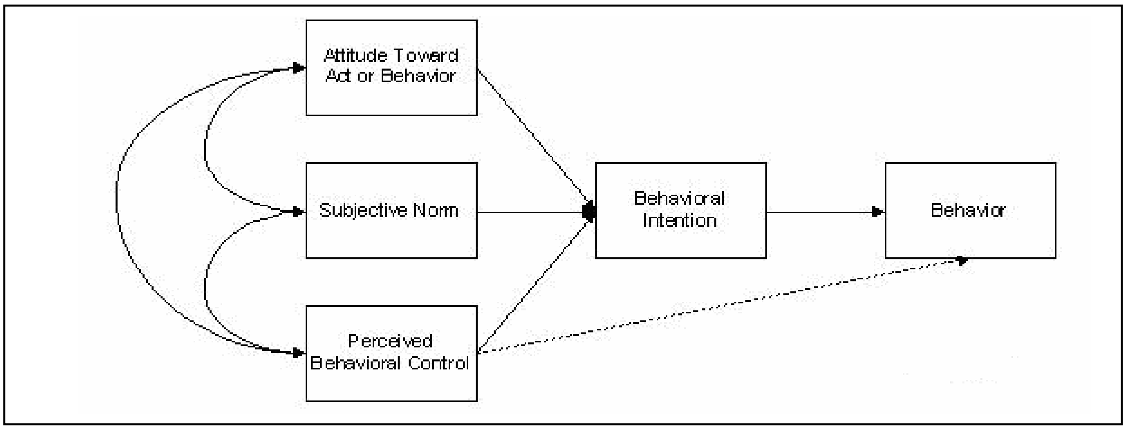


Source: (Fishbein and Ajzen, 1975)

2.3.1.3 Theory of Planned Behavior (TPB)

Theory of planned behavior is an extension of TRA by adding the construct of perceived behavioral control which is defined as "perceived ease or difficulty of performing the behavior". Perceived behavioral control is a product of individual's control belief and perceived facilitation. Perceived availability of skills, resources and opportunities will make control belief. Perceived facilitation is the individual's assessment of available elements that will assist the performance of such behavior. TPB holds that attitudes, subjective norms and perceived behavioral control are direct determinants which in turn influence behavior (Ajzen, 1991). Likewise Man, (1998) found that TPB has a better predictive power of behavior than TRA. For more details look to Figure (2.4):

Figure (2.4)
Theory of Planned Behavior



Source: (Ajzen, 1991)

2.3.2 Information Technology Acceptance Models

These are general theories of behavior. In the late 1980s such theories were studied and adapted to Technology Acceptance Model (TAM) (Davis, 1989; and Davis et al, 1989) which is the most frequently used theory. Many models have been proposed to explain and predict

concepts of IT system and its use, but the TAM has been the only one which has captured the most attention of the IS community (Chuttur, 2009), therefore *the researcher has selected it.*

2.3.2.1 Technology Acceptance Model (TAM)

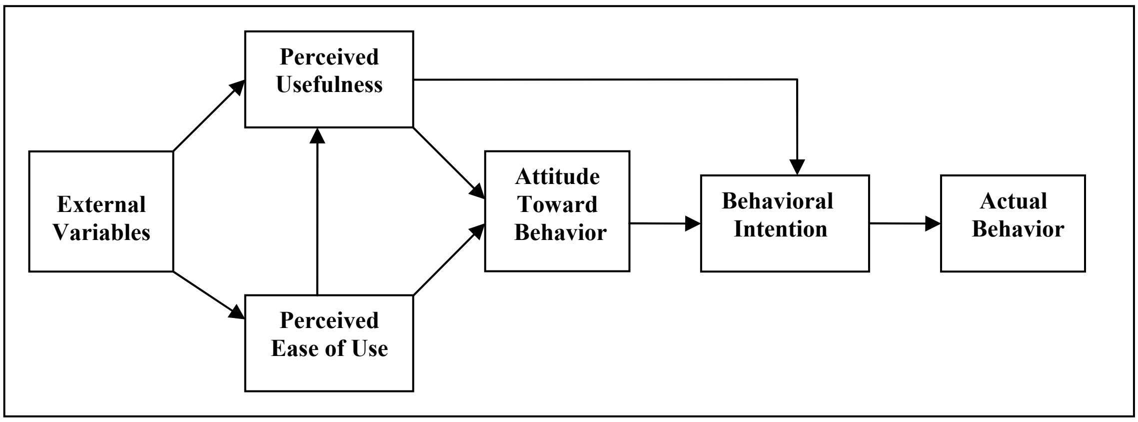
TAM was developed by Davis et al, in 1989 as Figure (2.5) it explained the acceptance of IT in performing tasks and identified two fundamental beliefs that influence the usage of an IS: PU and PEOU.

PU is defined as "the degree to which an individual believes that using a particular system will enhance his or her job performance." It relates to job effectiveness, productivity (time saving) and the relative importance of the system to one's job. On the other hand, PEOU is defined as "the degree to which an individual believes that using a particular system is free of effort." in terms of physical and mental effort as well as ease of learning (Davis, 1989). A specific application system is perceived to be useful by prospective users if they believe the system will improve or facilitate their job performance within the organizational context. The system is perceived to be easy to use if the prospective user believes that the use of the system will be free of effort (Davis, 1993).

PU and PEOU may be influenced by various external variables, possibly user`s features such as level of education, gender (Venkatesh and Morris, 2000). It has been found that all external variables influence the intention to use the IT system (Yarbrough and Smith, 2007; Lee et al, 2006).

Accordingly, the user's beliefs of usefulness not only have direct influence on their intention toward adopting IT, but have indirect influence on intention via attitude. Finally, the users' PU is influenced by his or her PEOU (Davis, 1993).

Figure (2.5)
Technology Acceptance Model



Source: (Davis, 1993)

The Differences between Technology Acceptance Model and Theory of Reasoned Action

In this section the researcher presents a comparison between the models that have been discussed above (TAM, TRA).

The TAM adopts the TRA model's causal relationships to explain an individual's IS acceptance behavior (Chuttur, 2009). The TAM shows that two particular beliefs, PU and PEOU are most relevant to IS acceptance behaviors. Consistent with the TRA model, the TAM states that the two beliefs determine the attitude towards using IS. Behavioral intention to use is, in turn, determined by the attitude towards using IS. Finally, behavioral intention to use leads to actual IS use. TAM uses TRA as a theoretical basis for specifying the causal linkages between the two key features: PU, PEOU, and users' attitudes, intentions and actual computer adoption behavior (Davis, 1989).

In the other hand differences between TRA and TAM were found by (Davis et al, 1989) these differences can be summarized in the following:

1. According to TRA, beliefs are bound to context and hence they cannot be generalized. Contrary to that, TAM states that PEOU and PU are issues that have an effect on acceptance of all IS.
2. In TRA all beliefs are summed together, but in the TAM both beliefs are seen as distinct constructs. Modeling each belief separately allows researchers to better trace influences of all of the affecting factors on IS acceptance.

Based on the previous comparison and arguments, the researcher selected and considered the TAM model as *the most convenient model* to be applied in the current research, because of its two major variables affecting the adoption of DSS and they are: PEOU and PU. The TAM has been tested by many researchers (see, for example, Taylor and Todd, 1995; Segars and Grover, 1993; Davis, 1989), and it has been found that TAM was better than other models such as (TRA and TPB) in IS area. Then, the relationship between TAM and DSS will be explained in the following Section.

2.3.2.2 Technology Acceptance Model and Decision Support Systems

Rigopoulos et al, (2008) incorporated TAM extensively as a methodology to measure attitude towards technology adoption from users in multiple domains. So, TAM variations have also been proposed and applied for measuring users' attitude towards adoption of several IT based services. However, there is no similar approach in the domain of DSS, measuring adoption of users in the case where a DSS replaces existing decision procedures. For this reason, the researchers demonstrate a revised TAM model for measuring users' attitude towards adoption of DSS like Rigopoulos et al, (2008).

The precedent research generated insights into the contextual issues surrounding the effective use and acceptance of DSS. That is built on the work of (Davis, 1989) TAM has been applied to many types of IS and IT. Hence, this research uses the two constructs from the TAM model that are PEOU, PU and investigates its effects on the successful adoption of DSS.

The researcher reveals that DSS adoption in the context of ASEZA will be driven by a group of factors, these factors are divided into four categories: System Characteristics, Technical Aspects, Organizational Aspects based on the previous studies and TAM model. The next section, will clarify these factors in details.

2.4 The Factors Influencing the Adoption of DSS in ASEZA

2.4.1 System Characteristics

As mentioned earlier, the characteristics of the systems that are derived from the TAM model will be used to investigate the issue of the DSS adoption as a result of its important role in this adoption, through the following two constructs: perceived ease of use and usefulness.

2.4.1.1 Perceived Ease of Use (PEOU)

Shen and Chiou (2010) examined the impact of PEOU on Internet service adoption based on the original research by (Davis, 1989) regarding the PEOU of TAM. According to TAM, PEOU is a major factor that affects acceptance of IS. PEOU is defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989).

This refers to the degree to which a person believes that using a particular technology will be free of effort. Users believe that a given application is useful, but they may, at the same time, believe that the technology is too hard to use and that the performance benefits of usage are outweighed by the effort of using the application. Besides, from the definition of "ease": "freedom from difficulty or great effort." Effort is a finite resource that a person may allocate to the various activities for which he or she is responsible. All else being equal, we claim, an application perceived to be easier to use than another is more likely to be accepted by users. Thus, PEOU explains the user's perception of the amount of effort required to utilize the system or the extent to which a user believes that using a particular technology will be effortless (Davis, 1989).

2.4.1.2 Perceived Usefulness (PU)

TAM posits that PU is a significant factor affecting acceptance of an IS (Saeed and Helm, 2008). Davis defined PU as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989).

People believe that any system will help them perform their job better. This includes decreasing the time for doing the job, more efficiency and accuracy. Moreover, from the definition of the word useful: "capable of being used advantageously." Within an organizational context, people are generally reinforced for good performance by raises, promotions, bonuses, and other rewards**.** A system high in PU is one for which a user believes in the existence of a positive use-performance relationship (Davis, 1989).

As TAM proposes, both PU and PEOU are important in technology acceptance and usage. However, their relative importance in the acceptance process has been shown to be different in previous studies. For instance, Davis (1993) found that PU dominated PEOU, whereas Adams et al, (1992) found PEOU to be more influential than PU, Which Chan (2009) concluded as the DSS use increased when PEOU and PU of the DSS are high.

In this research, the researcher examined the impact of PU and PEOU on DSS adoption and compatible with Rigopoulos et al, (2008) who found that PEOU and PU support the adoption of DSS. The next section clarifies other factors that impact adoption of DSS in this research.

2.4.2 Technical Aspects

There are many studies classifying the factors influencing the adoption process of IS (Kim and Galliers, 2004). These factors are grouped into different categories: Technological and Organizational factors. The researcher found that these factors have influence on successful adoption of DSS within the context of ASEZA, and attempted to present these factors in the following section.

In this section the researcher introduced the main technical aspects that impact adopting DSS: IT infrastructure and IS interoperability.

2.4.2.1 Information Technology Infrastructure

The main component of the IT investment, the development of an effective IT infrastructure is placed among the top concerns of overall IT management. Organizations spend a considerable amount of money and time to build IT infrastructure. However, a large number of companies have not achieved their expected returns from their IT investment; they seem to plunge into “IT black hole”. The critical reason is that these companies have not effectively combined IT infrastructure with their business resources to form “IT capability” (Xianfeng, 2008).

An IT infrastructure is a concept that means different things to different organizations at different times. Organizations today can choose from thousands of components to build their IT infrastructure from individual software to strategic functions. An IT infrastructure includes the

hardware, software, and telecommunications equipment that, when combined, provide the underlying foundation to support the organization's goals (Haag et al, 2005).

Laudon and Laudon, (2010: p.191) indicated that IT infrastructure consists of a set of physical devices and software applications that are required to operate in the entire enterprise. But IT infrastructure is also a set of organization wide service budgeted by management and comprising both human and technical capabilities.

Broadbent et al, (1999) argued that IT infrastructure consists of a portfolio of IT resources that are shared and used by organizations. It consists of both technical and organizational capabilities to provide the opportunities to share IT resources within and across the organizations, which provide a foundation to enable present and future business applications. These resources include (Duncan, 1995):

a. Computer hardware and software (e.g., operating systems);
b. Network and telecommunications technologies;
c. Key data;
d. Core data-processing applications;
e. Shared IT services.

The organization’s IT infrastructure basically integrates technology components to support business needs. The definition of IT infrastructure encompasses a variety of components, based on previous studies, Byrd and Turner (2000: p.172) provided a thorough definition of IT infrastructure as:

“The shared IT resources consisting of a technical physical base of hardware, software, communications technologies, data, and core applications and a human component of skills, expertise, competencies, commitments, values, norms, and knowledge that combine to create IT services that are typically unique to an organization. These IT services provide a foundation for communications interchange across the entire organization and for the development and implementation of present and future business applications”.

From these definitions the researcher noticed that the IT infrastructure is composed of two components: A technical IT infrastructure and a human IT infrastructure.

1. The technical IT infrastructure consists of the applications, data, and technology (Laudon and Laudon, 2010; Weill and Vitale, 2002; Broadbent and Weill, 1997; Duncan, 1995).
2. The human IT infrastructure consists of the knowledge and capabilities required to manage organizational IT resources. (Bruce and Valentin, 2002; and Lee et al, 1995). Davenport and Linder (1994) suggested that a robust IT infrastructure enables employees to be able to perform their respective jobs, both from having the available technology and the necessary technological skills.

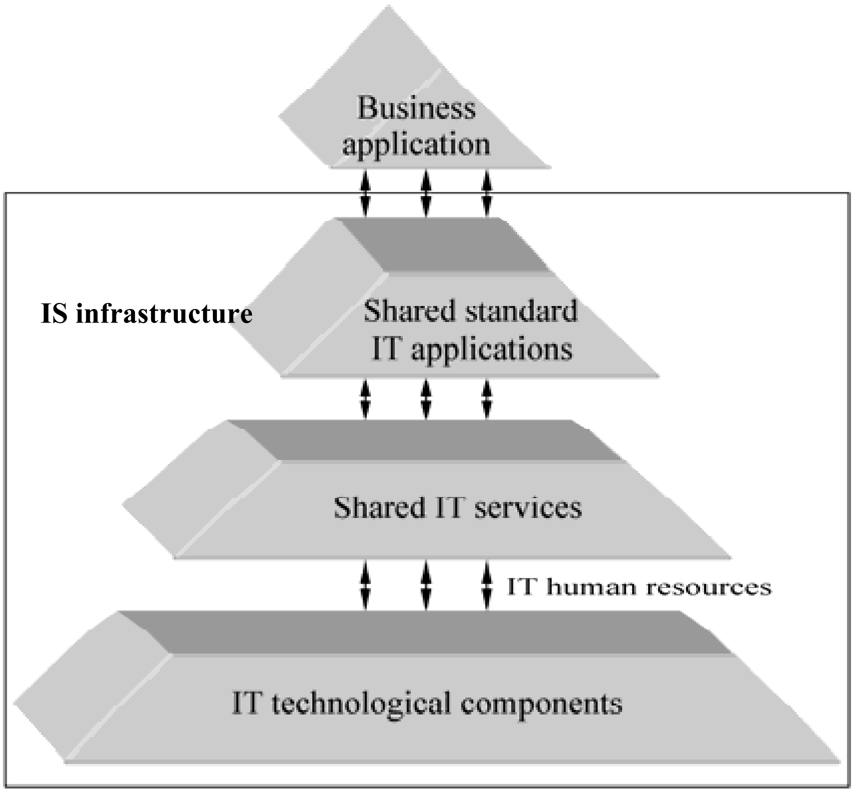
The Basic Components of Information Technology Infrastructure

Xianfeng (2008) indicated that IT infrastructure is composed of technological components, IT human resources, shared IT services, and business applications. **Figure (2.6)** illustrates the basic components of IT infrastructure (Bruce and Valentin, 2002; Byrd and Turner, 2001), which consist of four components as follows:

1. Shared technological components, including hardware and software platforms, networks, databases, communications, and other equipment and support required to enable business applications. They form the base of the IT infrastructure.
2. IT human resources, composed of human and organizational knowledge, skills, standards, experience, etc., which translate IT technological components into a reliable set of understandable, shared IT services that business people can understand.
3. Shared IT services, such as network service, system management, security management, provision of an extranet capability, or management of large scale data processing. This layer is viewed from the aspect of business use because describing IT infrastructure as a set of reliable services allows business people and technologists to discuss business models and their underlying infrastructure needs in the same language. IT components are converted into useful IT services by IT human resources.
4. Shared, standard IT applications. These components are relatively stable IT applications, which directly support business processes, such as human resource management, budgeting, accounting, purchasing, and other general ERP software.

IT infrastructure is defined in this research as any hardware or software used to build, operate, or maintain an organization's IS applications including decision support tools and technologies as well as the IT infrastructure of transaction processing systems, ERP, servers and networks that enable those applications to function. Thus, IT comprises not only the decision support tools themselves, but also the tools for developing the underlying functional aspects of a DSS (Bhargava et al, 1999). This research supported by Benamati and Lederer (2008) which found that success DSS depend on an IT infrastructure that gathers, stores, and provides appropriate information.

Figure (2.6)
The Basic Components of IT Infrastructure



Source: (Xianfeng, 2008)

The IT infrastructure provides the foundation or platform, on which the organization can build its specific IS (Laudon and Laudon, 2010). Based on the previous studies the researcher compared the IT and IS infrastructure, and found the following differences:

1. IT infrastructure is composed of technological components, IT human resources, shared IT services, and business applications (Xianfeng, 2008; Bruce and Valentin, 2002; Byrd and Turner, 2001; and Byrd and Turner, 2000), while IS infrastructure is composed of multiple platforms with different operating systems, applications, and connectivity arrangements exists (Broadbent et al, 1999; Brancheau et al, 1996; and Cash et al, 1992).
2. As Figure (2.6) shows, the researcher concluded that the IS infrastructure (shared standard IT applications) is only a part of the IT infrastructure.

Therefore the researcher decided to select IT infrastructure instead of IS infrastructure for its broader concept and as its applicability for the DSS in ASEZA.

2.4.2.2 Information Systems Interoperability

In a broad sense, IS interoperability refers to the use of computer-based tools that facilitate coordination of work and information flow across

organizational boundaries, focusing mainly on inter-enterprise distributed business processes and flows. It emerged mainly from the need to harmonize the operational heterogeneous networked environment, real information sharing, and the necessity to improve task coordination (Chituc et al, 2008).

According to (Ram,1991), IS interoperability represents the capability of two or more systems or components to exchange information, and to use it. While Stegwee and Rukanova (2003) extend this technical definition to an organizational context and suggest that IS interoperability resides at the interplay of human systems, business processes, and enabling technologies. Prior studies have explored IS interoperability issues in a wide variety of domains, including heterogeneous databases, information retrieval, knowledge systems, artificial intelligence, multimedia, GIS, interoperable system architecture design, and business process modeling. Ionescu et al, (2009) focused on consolidation of the financial data through the interoperability of the financial and accounting applications in the companies.

Interoperations can take place at the various enterprise levels. Although the following categorization is mainly given from a point of view of IT based applications (Chen et al, 2008), and these categories are:

1. The interoperability of data: It refers to make different data models and query languages working together. The interoperability of data deals with finding and sharing information from heterogeneous data sources, and which can moreover reside on different machines under different operating systems and data base management systems.
2. The interoperability of services: It is concerned with identifying, composing and making various applications function together (designed and implemented independently). The term 'service' is not limited to the computer based applications; but also functions of companies and networked enterprises.
3. The interoperability of processes: The aim is to make various business processes work together: a process defines the sequence of the services (functions) according to some specific needs of a company. In a networked enterprise, it is also necessary to research how to connect internal processes of two companies to create a common process.
4. The interoperability of business: It refers to working in a harmonized way at the level of organization and company in spite of, for example, the different modes of decision-making, methods of work, legislations, culture of the company or commercial approaches so that business can be developed between companies.

Information Systems Integration

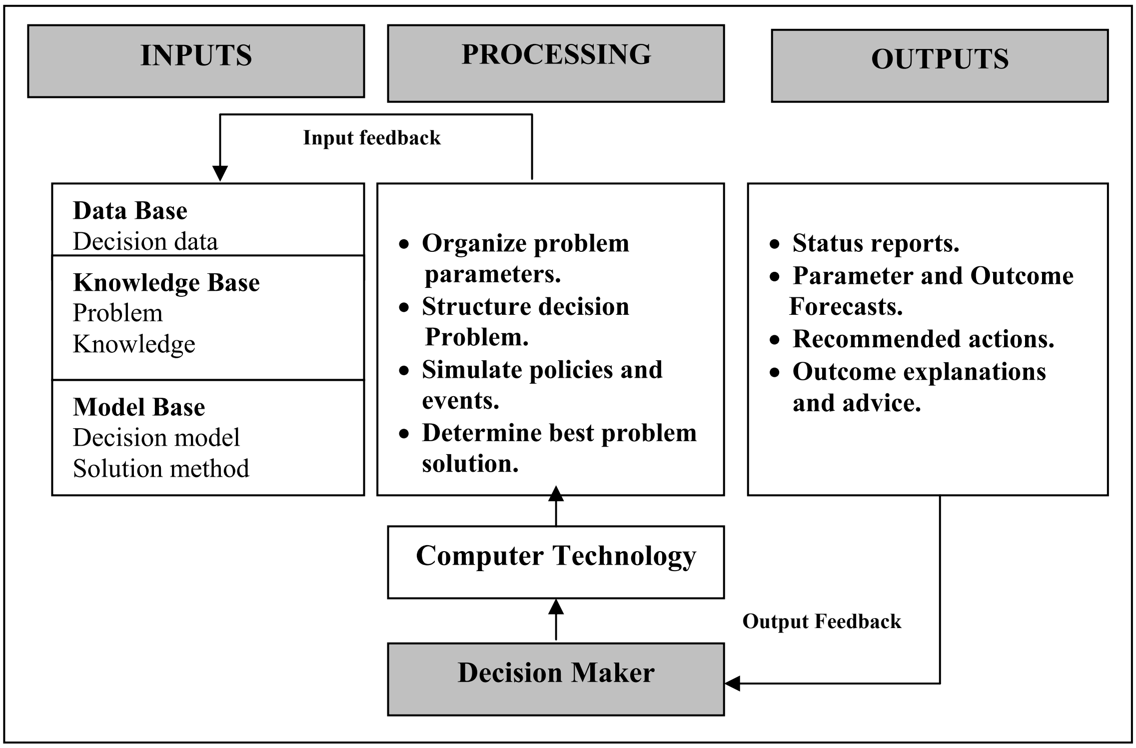
Hussein et al, (2007) indicated that IS integration is significantly correlated with the IS success. IS integration refers to the degree to which different systems are integrated in terms of data, functionality and appearance (Whyte and Bytheway, 1996). According to Saunders and Jones (1992), integration refers to the integration of technologies across other organizational units. They added that IS integration is needed to ensure a smooth and cost-effective flow of information across all business functions.

Bhatt (2000) found significant effects of data integration and communication network integration on process improvement initiatives and customer focus in Fortune 500 US organizations. The previous discussion suggests that IS integration is an important factor in successful adoption of DSS.

Integrated System Framework Concerning DSS

This framework proposed by Khoo et al, (2009), Figure (2.7) shows the framework of the proposed integrated system.

Figure (2.7)
Integrated System Framework



Source: (Khoo et al, 2009)

A DSS have three major inputs. There is a database, knowledge base and model base as mentioned in Section (2.2.3). Decision-makers utilize computer technology (hardware and software) to process the inputs into problem relevant outputs. Processing will involve:

1) Organizing problem parameters – accessing the data base, extracting the decision data, and organizing the information in the form needed by the solution model and methodology.
2) Structuring the decision problem – accessing the model base, retrieving the appropriate decision model, and operation (attaching organized parameters) to the decision model.
3) simulating policies and events – using the operational decision model to perform the computations needed to simulate outcomes from user-specified alternatives and then identifying the alternative (or alternatives) that best meets the decision criterion (or criteria) among those tested.
4) Finding the best problem solution – accessing the model base, retrieving the appropriate solution method, and using the retrieved method to systematically determine the alternative (or alternatives), among all possible alternatives, that best meets the decision criterion (or criteria).

The system can use problem ideas, concepts and knowledge drawn from the knowledge base to assist users in performing these processing tasks. Processing will generate status reports, forecasts, recommendations and explanations (Inputs).

1) The status reports will identify relevant uncontrollable events, decision alternatives and decision criteria and show the current values these problem elements.
2) Forecasts will report the events and alternatives specified in the simulations and the resulting projected values of the decision criteria.
3) The recommendations will suggest the values for the decision alternatives that best meet the decision criteria, and the corresponding criteria values, under current and forecasted values for the uncontrollable events.
4) Explanations will justify the recommendations and offer advice on further processing. Such advice may include suggestions on interpreting the output and guidance for examining additional scenarios.

The system provides both input and output feedback to the user:

a) Input feedback from the processing provides additional data, knowledge and models that may be useful for future decision-making.
b) Output feedback (which can include outcomes, cognitive information, task models and what-if, goal-seeking and other types of sensitivity analyses) is used to extend or modify the original analyses and evaluations.

The researcher noticed a big relevance between the two concepts of interoperability and integration and therefore he presented a thorough and wider view of both concepts and highlighted the differences and commons in each concept.

Chen et al, (2008) have found several differences between interoperability and integration as the following:

1. Interoperability has the meaning of coexistence, autonomy and federated environment, whereas *integration* refers more to the concepts of coordination, coherence and uni-formation.
2. In the case of interoperability*:* 'Loosely coupled' means that the components are connected by a communication network and can interact; they can exchange services while continuing locally their own logic of operation, On the other hand In the case of a fully *integrated* system, 'Tightly coupled' indicates that the components are interdependent and cannot be separated (Chen and Doumeingts, 2003).
3. Interoperable systems can function independently, *integration* is generally considered to go beyond mere interoperability to involve some degree of functional dependence. An integrated system loses significant functionality if the flow of services is interrupted.
4. Interoperability is more of a technical issue; it means that systems or units do not interfere with each other's functions, while *integration* deals with organizational issues, in possibly a less formalized manner due to dealing with people, but integration is much more difficult to solve.
5. Interoperable systems are by necessity compatible, but the converse is not necessarily true. In sum, interoperability lies in the middle of an ''Integration Continuum'' between compatibility and full integration (Panetto and Molina, 2008).

After reviewing the previous studies and doing a thorough comparison between both concepts (interoperability and integration), the researcher decided to choose interoperability instead of integration as it is more compatible with the systems, more relevant with the work context of ASEZA and its applicability for the DSS in ASEZA which is clarified through the study of ASEZA context in the *next section*.

Interoperability Systems Framework Development in ASEZA

A research has been conducted by the U.S Agency for International Development (USAID) (2002) to support development of the ASEZA. It indicated the importance of IS interoperability in ASEZA, it defines an integrated net of IT systems, the framework for their interoperability and information sharing, and provides the base for discussion of the roadmap of the future development and deployment of these IT systems at the functional units within the ASEZA's commissions.

One of the fundamental elements of computerizing an institution like ASEZA is the definition of its information operability standards, and setting the policies for information exchange and sharing among the various IT systems that computerize the key operations of an institution.

Interoperability would create significant benefits since it would also allow for connectivity with other organizations that ASEZA exchange information with. Lastly, the proper use of information entities by the correct and authorized functions at ASEZA plays an important role in preserving the integrity, and privacy of information, with no compromise to its sharing and transparency in view of the above, the development of interoperability system framework and IT System.

The IS Interoperability framework and IT Systems architecture is the culmination of information modeling and data framework development as follows:

One: Information Modeling. Information modeling involves the analyses of information needed by the different business activities into a high-level information view for ASEZA. This view is linked to the business framework defining the business functions for the future direction of ASEZA. The outcome of this analysis is the Information Model defining major information needs (e.g. high-level information entities) which support future business activities.

Two: Data Framework Development. This action produces from the information model a detailed and structured data design for ASEZA, which individual applications can use as a logical database design. Outcome: A data framework providing a more detailed logical design model including relationships and standards of information entities.

Three: Systems Framework Development. This step will produce from the information model and the data framework a model of the systems needed for ASEZA and their interoperability. Outcome: A System Framework - defining detailed architecture of integrated future system's needs, priorities, and interdependencies including relationships and standards interoperability.

Information Technology Systems within ASEZA

Building an IT system starts with the definition of the business activities and the exchanged information entities, and ends up with the deduction of several IT systems that interact in order to computerize these activities. The following conceptualized IT systems of ASEZA were derived from data entities, their relationship, and the method of their access and use by the different activities of ASEZA, as follows:

1. The mapping of the information exchanged among the various business activities into the information model, in combination with the resultant logical database model, shed light on the relationship between the information and their use by the different ASEZA activities.
2. Based on these information models, the more specific and detailed information entities were studied, and gathered into a single database to be accessed by one user-interface unit.

3. These user-interface units were then clustered, where similar in information nature, and integrated into an IT Application System. This system performs different manipulation functions of the information within its databases, and interfaces and exchanges information with other IT systems in a standardized format and according to the functionality of its users.
4. Based on the above, the users of each application system, and the access method and manipulation of the database, could be specified per system.
5. Based on the data entity relationship within the logical database model, the macro-level processes of the information model, and the basic connecting Identifiers or Access Keys were defined, connections among various systems became clear. This, in turn, identified the relationships and inter-dependencies amongst the various application systems.
6. Based on the interaction between the business activities and their sharing of information entities, the level of dependency, interaction, and system-to system access was defined.

The Information Systems within the Context of ASEZA

In this section the researcher presents the main IS applied in commissions within the context of ASEZA, Table (2.3) indicates few examples of the IS's used in ASEZA .All the IS's in ASEZA will be clarified in a detailed (Appendix (II): ASEZA Information Systems and Sub-Systems).

Table (2.3)
Commissions IS within the Context of ASEZA

Commission / Department	Information Systems
Administration and Finance	ASEZA Personnel and Human Resource Development System, ASEZA Financial System.
Investment and Economic Development	Investment Opportunities Management System, Investment Queries Management System.
Environmental	ASEZA Technical Standards System, GIS and Environmental Inspection Scheduling and Monitoring System.
Land, Infrastructure and Services	ASEZA Planning GIS System, Aqaba Land Transaction and Ownership Tracking System.
Customs and Revenue	Sales Tax Management System, Income Tax Management System.

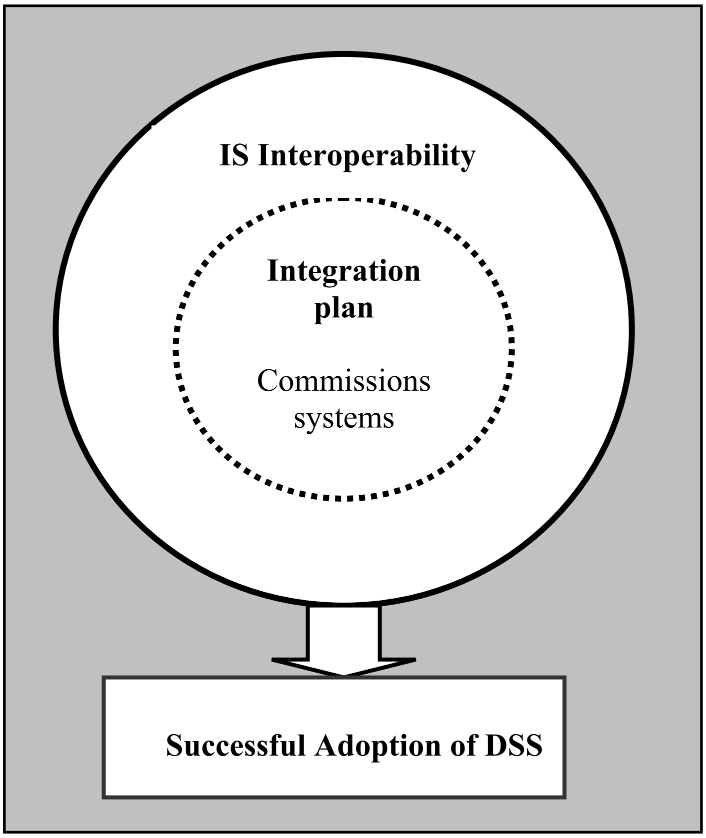
Source: (ASEZA, 2002)

Information Systems Interoperability and Decision Support Systems

Based on the previous discussion and explanation of both IS interoperability and the IS integration through the previous section, the researcher referred the following:

The IS integration (Integration Plan) consists of the mutually affecting commissions systems of ASEZA "Environmental, Investment and Economic development, Administration and Finance, Infrastructure, and Customs and Revenue commission systems". So, integration plan is a functional active part of the IS interoperability, see Figure (2.8) which simplifies the process of DSS adoption.

Figure (2.8)
Framework of DSS Adoption



2.4.3 Organizational Aspects

Based on an extensive review of the available literature, it is revealed that a number of organizational factors can influence adoption of DSS. Ngai et al, (2008) found that TMS is critical factor to the successful implementation of IS. Also, identified organizational variables as TMS, MS, department structure, size of IS function, evaluator perspective, culture, and IS budget size by (Rezaei et al, 2009; Hussein et al, 2007; Lu and Wang, 1997; Saunders and Jones, 1992). Shaukat and Zafar (2010) found that OS impact on the implementation of IT. Ang et al, (2001) identified organizational factors that influence IT usage as OS, TMS,

organizational size, managerial IT knowledge, financial resources, goal alignment and budgeting method.

In the next section and based on a comprehensive list of organizational factors from related studies (Shaukat and Zafar, 2010; Ngai et al, 2008; Elbeltagi et al, 2005; Ang et al, 2001; and Tallon et al, 2000), the researcher will discuss three organizational factors that influence successful DSS adoption in this research. The three factors are TMS, MS and OS.

2.4.3.1 Top Management Support

TMS has been identified as a key predictor in the adoption and implementation of IT (Fink, 1998). Several previous studies have shown that TMS is a significant predictor of technology adoption and leads to more successful IT use in many organizations (Seyal and Rahman, 2003; Caldeira and Ward, 2002; Tang and Teo, 2000). It is important to create a supportive climate and adequate resources for the adoption of new technology (Premkumar and Roberts, 1999).

Top management would be able to identify business opportunities for the exploitation of IT and their active involvement and support would provide appropriate strategic vision and direction for the adoption of new innovations (Thong et al, 1996). Moreover, this characteristic would also send signals about the importance of the innovation and succeed in overcoming organizational resistance to accept the IS. As a result, securing the support of top management will lead to obtaining necessary assistance related to required capital spending and labor support , and the cooperation to complete for resources in the project-planning and development stage (Grover, 1998). In addition, Elbeltagi et al, (2005) indicated that TMS is as an important factor of DSS usage success.

However, without the support from top management, it will result in stronger resistance from employees and will become a substantial barrier to the adoption of data warehouse (Haley, 1997). Therefore, it is expected that the greater the extent of TMS, the more likely the organization will adopt DSS.

2.4.3.2 Management Style

MS is a key requirement for successful implementation of any system (Rezaei et al, 2009; and Hussein et al, 2007). MS deals with the way in which the management tends to influence, coordinate, and direct people’s activities towards group’s objectives (Robbins, 1994; Aldag and Stearns, 1991). Lu and Wang (1997) pointed out that many studies have categorized MS into people-oriented and task-oriented tasks. People-oriented managers consider inter-personal relationship and are concerned with mutual trust, friendship, respect and warmth. On the other hand, task-

oriented managers tend to focus more on task aspect of jobs and deals with defining and organizing tasks for goal attainment.

Lu and Wang (1997) investigated the relationship between MS with user participation and systems success over MIS growth stages. The researchers found mixed results. They found that MS were related to system success differently over the MIS growth stages. For example, at the development stage and the maturity stage, both people-oriented and task-oriented styles had positive significant relationship with system success. On the other hand, at the initiation stage, both styles have no effect on system success. They argued that at the initiation stage, computer is being introduced to the organization and users must learn the new technology on their own. This, in turn ended up into dissatisfaction among the users.

An important component of MS is leadership style. Lu and Wang's study (1997) seems to support the major finding in Igbaria and Nachman study (1990) on the relationship between leadership style and user satisfaction. Both studies found that leadership style and system success correlate significantly and positively. However, the authors agreed that more issues need to be explored involving the many styles of management and leadership.

However, the authors agreed that more issues need to be explored involving the many styles of management. Based on the above discussion, the researcher believes that MS may influence DSS adoption.

2.4.3.3 Organizational Structure

Shaukat and Zafar (2010) said that OS is an important factor to be considered in technology adoption. Similarly interaction among members at all levels among all departments and teams is also necessary for successful introduction of new technology. Also Liu and Hu (2007) found that OS has an effect on technological innovation.

Vroom (2002: p.54) defined OS as "the way in which an organization is built up, the way in which relations and relationships between people in an organization are more or less regulated". The OS needs to provide a frame to differentiate the organizations or units main task and to allocate derived subtasks to different workers. Subsequently these subtasks need to be reintegrated to achieve the overall goal (Mintzberg, 1983).

It provided an overview of OS characteristics that are typically addressed in literature: differentiation and coordination, standardization (i.e. existence of standards or routines), formalization (i.e. the degree of writing down information and procedures), centralization (i.e. the level of decision power), and configuration (i.e. hierarchy) (Vroom, 2002).

Weber (1947) distinguishes the following dimensions of OS: division of work, hierarchy, rules and procedures, and formalization. These

dimensions match Vroom's (2002) more recent overview of typically addressed structural dimensions which uses a slightly different terminology: differentiation (division of work) and coordination, standardization (existence of standards or routines), formalization (degree of writing down information and procedures), centralization (level of decision power), and configuration (hierarchy).

According to Stair and Reynolds (2010), OS refers to organizational sub-units and the way they relate to the overall organization. An OS can affect how IS are viewed and used. Although there are many possibilities, OS typically falls into one of these categories: Traditional, Project, Team, Multidimensional, or Virtual.

1. Traditional (hierarchical): OS in which major department heads report to president or top-level manager.
2. Flat: OS with a reduced number of management layers.
3. Project: structure centered on major products or services.
4. Team: structure concerned on work teams or groups.
5. Multidimensional: structure that may incorporate several structures at the same time.
6. Virtual: structure that employees individuals, groups or complete businesses units in geographically dispread areas.

Based on the OS of ASEZA as presented in Appendix (III) the researcher concluded that ASEZA's OS is *hierarchical*. Every organization is divided into different departments, sections and teams with varying responsibility and authority. If it is not properly aligned for implementation of a new technology, an OS can prove to be a great barrier in adopting of new technology.

So, the researcher sees that OS is an important factor to be considered in DSS adoption. Similarly interaction among members at all levels among all departments and teams is also necessary for successful DSS adoption.

In the following section, as the demographic characteristics play significant role in the adoption process of any new system, the researcher discusses the effects of these characteristics on the adoption of DSS.

2.4.4 Demographic Characteristics

The researcher found various numbers of studies regarding the demographic characteristics affecting the adoption of DSS, Liu and Chen (2008) found that individual differences have an effect on user acceptance of DSS. Masrek et al, (2007) has discussed the major demographic characteristic that influence new technologies adoption and they are:

Age: the influence of *age* has been demonstrated in many technology adoption studies (Jones and Hubona, 2005; Venkatesh et al, 2003). A

research by Yi et al, (2005) indicated that *age* may influence technology use in multiple ways i.e.

1. Directly affecting technology use.
2. Indirectly influencing technology use through perceptions.
3. Moderating the relationships between perceptions and technology use.

Gender: statistics on IT access and use across countries also reveal *gender* as one of the most important factors influencing IT adoption and utilization (Rhee and Kim, 2004; Cheong, 2002). Dholakia et al, (2003) noted that 'men and women have different cultures, are specialized in different tasks, and have different preferences. Such differences tend to interact with the features found in the Internet that intensify their PU and PEOU in favor of men rather than women. Many studies have assessed the role of gender and found that perceptions and usage do differ across gender. Males tend to expand the use of IS and explore it more if they believe that using the IS has helped them in improving their work. Earlier studies have found that the relationship between IS usefulness and intention to use the IS is stronger in males than females (Venkatesh and Morris, 2000; Karahanna et al, 1999).

Education Level: studies have shown that individuals having higher level of education are generally more aware of technology benefits; suggesting better possibility of embracing technology (Jones and Hubona, 2005; Ali and Money, 2005).

Employment Level: studies investigating the effect of employment category on IT adoption produced mixed results (Hubona and Geitz, 1997; Tillquist, 1996). With regard to intranet research, Weitzel and Hallahan (2003) found that employment category is influential in determining intranet adoption.

Experience: while experience may lead to the formation of a more coherent cognition regarding what characteristics of the IS make it more useful. The users with varying levels of experience may weigh IS characteristics differently. This difference can reflect on the formation of their perceptions regarding the IS usefulness (Saeed and Helm, 2008). Further, this difference may also manifest itself on DSS adoption. Karahanna et al, (1999) found that the relationship between IS usefulness and IS adoption is stronger for user's with higher level of experience.

The researcher suggested other several demographic characteristics affecting the adoption of DSS in ASEZA in addition to the characteristics mentioned previously such as: commissions, job description and these characteristics were tested in this research, to explain the extent of its influence on DSS adoption.

This research attempts to explore the main factors that contribute to the successful adoption of DSS in the context of ASEZA - which are system characteristics (PEOU and PU), Technical Aspects (IT

infrastructure and IS interoperability), Organizational Aspects (TMS, MS, OS), and Demographic Characteristics (gender, age, educational level, commissions, job description, and experience). Therefore, the researcher conducted this research to test the impact of the preceding factors on the successful adoption of DSS within the context.

2.5 Previous Studies

Chan (2009) purposed: (1) obtain measures of actual DSS use that include the three elements of DSS use proposed by Burton-Jones and Straub (2006), and (2) identify an important psychological construct – a user's motivation to perform a task – and examine how it interacts with two DSS characteristics – effectiveness and efficiency to affect actual DSS use. As predicted, the findings indicated that individuals who used a more effective DSS to work on a task that they were motivated in increased usage of the DSS, while DSS use did not differ between individuals who used either a more or less effective DSS to complete a task that they were less motivated in. The results also showed significant difference for two measures of DSS use and no significant difference for one measure of DSS use between individuals who used either a more or less efficient DSS to perform a task that they were more motivated in. As expected, significant differences were found for individuals who used either a more or less efficient DSS to complete a task that they were less motivated to. Finally, the results showed that DSS use increased when PEOU and PU of the DSS were high; therefore, these results corroborate the findings of prior research in the context of actual DSS use.

This study was conducted in collaboration with the Greek bank by Rigopoulos et al, (2008) formulated a revised TAM model for measuring users attitude towards adoption of DSS and executed a survey at the bank. A focus group was selected form the bank .The population consisted of the potential users of the DSS that execute existing heuristic based classification. Questionnaires were used to collect the data, indicated that PEOU and PU supported the adoption of DSS, which provides strong evidence that the new DSS supports efficiently the decision process and can replace existing heuristic procedure, which tends to be time consuming and less structured.

Benamati and Lederer (2008) sought to understand the problems of rapid IT change and the interrelationships between them in order to improve the acquisition and implementation of new IT that provides the infrastructure for DSS. It employed qualitative and quantitative data collection in two separate phases. It used the qualitative data from the first to generate an instrument to gather the quantitative data in the second. It then applied both exploratory and confirmatory data analyses as well as structural equation modeling to the quantitative to generate and test new

theory to explain the intricacies of the challenges of rapid IT change, which used structured interviews with 16 IT professionals and 246 useable responses from a survey of 1000 such professionals. It found that successful DSS depend on an IT infrastructure that gathers, stores, and provides appropriate information.

Jeyaraj and Sabherwal (2008) focused on individual, organizational, and technological factors that influence the level of adoption. Probably due to this focus on factors affecting adoption, little is known about the processes by which individuals adopt IS or IT innovations. This study set out to examine the processes by which individuals within organizations adopted IS or IT innovations. It conducted optimal matching and cluster analyses using data obtained from 27 interviews about the adoption of 30 IS or IT innovations in actual work settings, and treating the IS or IT adoption phenomenon as a series of actions, they found three intertwined sets of actions, i.e., contextual, influencer, and adopter's actions, that together provide a useful way of understanding the innovation adoption process.

Jarupathirun and Zahedi (2007) attempted to explore the factors that impact perceived successful use of web-based Special Decision Support System (SDSS) in terms of users' perception of its performance. They proposed two main constructs that may have a major role: perceived Task–Technology Fit (PTTF) and perceived goal commitment. Relying on theories in PTTF and goal-setting theory as well as additional theories in psychology and SDSS research and its related hypotheses were tested using laboratory experiment, which is an appropriate method to establish the cause and effect of constructs being examined, the participants in the experiments were undergraduate students in a business school. They theorized that spatial abilities and self-efficacy could impact perceived PTTF, which in turn influences the success of SDSS in terms of users' satisfaction (with decision and technology) as well as their perceived benefits of SDSS in terms of perceived decision quality and efficiency.

Williams et al, (2007) conducted a laboratory experiment to examine the effect of DSS use on the decision maker's error patterns and decision quality for two levels of information load (low and high). It found that, DSS can help decision makers develop a better understanding of the essence of a decision problem and can reduce logical error (especially if the information load is high).

Cowie and Burstei (2007) addressed the issue of quality of data that was considered as an important factor influencing the quality of the decision by implement of the mobile DSS. In their study viewed that the mobile decision maker will benefit if provided with a measure of the quality of the data used in deriving a decision when they proposed a quality of data model taking into account static and dynamic properties of

the mobile decision context, and used multi-criteria decision analysis to represent decision model and derive a quality of data measure. A prototype mobile DSS has been developed to investigate the usefulness of the quality of data.

Forgionne and Newman (2007) attempted to examine that creativity enhancements can be delivered through a DSS after conducting an empirical study on upper level undergraduate students at a regional public university and they found that creativity-enhanced concept is superior to traditional DSS approaches in guiding the decision-maker toward an effective policy or strategy.

Gonul et al, (2006) examined the effects of structural characteristics of explanations provided within a forecasting DSS context. In particular, the effects of explanation length (short vs. long) and the conveyed confidence level (weak vs. strong confidence) are examined. Strongly confident and long explanations are found to be more effective in participants' acceptance of interval forecasts. In addition, explanations with higher information value are more effective than those with low information value and thus are persuasive tools in the presentation of advice to users. It concluded that explanations can influence a user's acceptance of the DSS advice and suggests, for a forecasting application, what structure of explanations seems most appropriate. Given the evidence of low acceptance of DSS advice, this is an important contribution suggesting that explanations may be a means of improving DSS success.

Elbeltagi et al, (2005) examined the usage of a DSS in Egyptian local authorities using an adapted TAM. The centrally-developed DSS had been rolled out to 27 governorates in Egypt for use by chief executive officers. The results demonstrated that TAM could be applied to a specific system within a developing country. Both PEU and PU had a significant direct effect on DSS usage. PEU dominated over PU whose effect on DSS usage was negative; also it found that TMS has a major effect on DSS use.

Bharatia and Chaudhury (2004) attempted to understand factors that impact decision-making satisfaction in web-based DSSs. A small group of 15 undergraduate students participated in the survey, the instrument was administered in a laboratory setting, which had 24 personal computers running Wintel platform. The subjects were senior year business school undergraduates and graduate MBA students at two different universities. Used structural equation modeling approach, the analysis explored that information quality and system quality influence decision-making satisfaction, while information presentation does not have an effect on decision-making satisfaction.

Kohli and Devaraj (2004) measured the contribution of an institutional DSS to user organizations' performance. It utilized longitudinal data across 36 monthly periods from eight healthcare

organizations that evaluate contracts using the DSS. The results of this study have provided evidence that DSS usage leads to improvements in organizational performance.

While Chen and lee (2003) emphasized the need to support the decision maker's general thinking processes presented in systems such as DSS, to reduce cognitive biases in decision making. An exploratory two-phased case study was conducted to collect feedback from real business decision makers on the proposed system and provide some initial evidence that the system could be a valuable cognitive support tool after further development.

Moynihan et al, (2002) developed a DSS for asset and liability management in financial institutions. The system utilizes historical data to develop algorithms that can forecast the amounts of assets and liabilities. Simulation models are used to identify the crests and troughs of the primary interest rate, and to forecast interest rates for future cycles of interest. The outputs of the algorithms are utilized to calculate the gap position and interest rate risk of the institution. ‘‘What-if’’ analysis features are incorporated into the system to determine the favorable alternatives in changing market environments.

Lawrencea et al, (2002) investigated the impact of user satisfaction and forecasted accuracy of user involvement in the design of a Forecasting Decision Support System (FDSS), it has found that user participation in the design of a FDSS increase the users satisfaction with the system and base for successful processes and outcomes in the organizations, and it directly affects the PEOU and PU of a system and it affects how a system is being perceived by its user based on his or her satisfaction.

Lu et al, (2001) presented path analytic model of people’s willingness to use different computerized models from the perspectives of individual’s cognitive styles, beliefs and attitudes. After surveying 108 senior students in two MIS courses at National Taiwan University of Science and Technology in Taipei, Taiwan, this study generally contends that computerized models with interface are easy to use, but the willingness to use those models in the future is not universal. The relationships between cognitive styles and DSS acceptance vary across the types of models such as the fuzzy weighted-sum model, analytic hierarchy process, or the linear weighted-sum model. Overall, the path analysis reveals that the willingness to use computerized models appears to rely heavily on preferences and PU. Notably, removing barriers that would allow people to believe that using DSS is easy would have direct effect on its PU and subsequent indirect effects on people’s preferences and willingness to use DSS.

Forgionne and Kohli (2000) Assessed the effects of DSS on the process of decision-makers and outcomes of a simulated healthcare

organization, DSS had significant effect on the decision maker ability to recognize problems, generate and evaluate alternatives, and choose final alternative; rated the system as effective in decision-making.

Finlay and Forghani (1998) conducted a field research which was carried out to develop and validate the classification of factors of DSS success. The implementation of 39 DSS was reviewed in 27 organizations that together were using 22 DSS generators. 131 factors were verified in the field research as impacting on the successful implementation of DSS such as: Organizational and Technical factors. A second field research investigated the importance of these factors in one specific situation, and demonstrated the use of the classification in providing guidance to practitioners operating in similar contexts.

Sanders and Courtney (1985) conducted to investigate the influence of organizational factors on DSS success. A field study involving 124 organizations, and 378 DSS users. Three groups were analyzed in the study: managers, financial and planning analysts, and "others" who were predominantly management scientists or data processing analysts. The results re-affirmed that the level of top management support, user training, and length of DSS use are important correlates of DSS success. A summary of some of the previous studies" factors affecting the adoption of DSS" are listed in the next table (Table 2.3).

Table (2.4)
Summary of Previous Studies

Authors	Purpose	Data sources	Major results
Shaukat and Zafar, (2010)	To identify the impact of sociological and organizational factors on IT adoption.	The primary data was collected through in-depth interviews and field surveys of 48 companies, 24 in manufacturing sector (12 local and 12 foreign) and 24 in banking sector (12 local and 12 foreign), in Pakistani companies.	Found that OS impacts the adoption of IT.
Rezaei et al, (2009)	To investigate the influence of organizational factors on MIS success.	Survey questionnaires were gathered from 132 Extension Managers from Iran's Agricultural Extension Providers.	Found that all the organizational factors (department structure, IS infrastructure and MS) are significantly correlated to the success of IS.
Liu and Chen, (2008)	To examine the effect of individual differences, tasks, and decision models on user acceptance of DSS.	Experiment strategy applied on 300 business students from mid-west university.	Found that individual differences have effect on user acceptance of DSS.
Ngai et al, (2008)	To examine the critical success factors in the adoption of Enterprise resource planning.	The review covers journals, conference proceedings, doctoral dissertation, and textbooks from these 10 different countries and regions in China.	Found that TMS is critical factor to the successful implementation of ERP systems.

Hussein et al, (2007)	To investigate the influence of technological factors on IS success.	Using a survey method, data were gathered from 201 users from four electronic government (EG) agencies in Malaysia.	Found that IS integration has a positive effect on IS success.
Lee and Kim, (2007)	To examine the various factors that affects the implementation's success of Internet-based information systems.	Structured questionnaire 129, Interviews 9 From among the 2000 companies 120 companies selected in Korean.	Found that (TMS, IS infrastructure) positively related to IS implementation success.
Hussein et al, (2007)	To investigate the influence of organizational factors on IS success in selected public sector agencies in Malaysia.	Survey questionnaires were gathered from 201 users from four central agencies located at the central administration complex in Putrajaya.	Found that all the organizational factors (TMS, MS, Decision-making structure) are significantly correlated to the success of IS adoption.
Ana et al, (2006)	To explore organizational factors affecting Internet technology adoption.	Questionnaire-based data from 280 companies in Spain.	Found that OS significantly correlated to success internet technology adoption.
Shah and Siddiqui, (2006)	To investigate organizational critical success factors in e-banking adoption at The Woolwich bank.	Data was collected using interviews, observations and referring to historical documents (data triangulation) of the Woolwich bank in United Kingdom.	Found that the organizational factors would be most critical for success in e-banking adoption.
Elbeltagi et al, (2005)	To evaluate the Factors Affecting DSS Usage by Senior Managers in Local Authorities in Egypt.	It used 450 questionnaires which were personally delivered to Governorates across Egypt.	Found that TMS has greatest effect on DSS usage.

Hwang et al, (2004)	To identify critical factors influencing the adoption of data warehouse technology.	The questionnaires used in this study are to collect appropriate data in Taiwanese banks. A total of 50 questionnaires in the banking industry in Taiwan.	Found TMS is an important factor affecting the adoption of data warehouse technology.
Nathan et al, (2004)	To study the relationship between top management support, the IS function and performance.	Survey questionnaires were mailed to 800 IS executives of organizations in the US.	Found that TMS has a significant in influencing the effectiveness of the IS function in an organization.
Grandon and Pearson, (2004)	To Examine the determinant factors of strategic value and adoption of electronic commerce as perceived by top managers in small and medium sized enterprises (SME) in the Midwest region of the US.	They collected data from top managers or owners of SME by using an Internet survey (100) in US.	Found that PEOU, and PU have significant positive relationship with successful of electronic commerce adoption.
Kohli and Devaraj, (2004)	To measure the contribution of an institutional DSS to user organizations' performance.	Longitudinal study across 36 monthly periods from eight healthcare organizations.	Found that DSS usage leads to improvements in organizational performance.
Bradford and Florin, (2003)	To examine the success factors of ERP systems by develop a model that draws upon Diffusion of Innovation (DOI) theory and IS implementation literature.	A survey was administered to randomly select members of America's SAP User Group.	Found TMS positively related ERP implementation success.

Bajwa and Ross, (2002)	To identify the factors influencing the adoption and implementation of organizational intranets.	Used case study that is based on observations of an intranet development project within the business school of a university in the northwest.	Found that TMS and user characteristics have effect significance on successful adoption of IT is widely accepted.
Tang, (2000)	To identify the factors influencing the success of Intranet adoption: an exploratory and empirical research.	A survey was distributed to 27 computer executive officer (CEOs) of 25 enterprises and 2 technologists working in Taiwan.	Found that TMS, IT, and IS integration have significantly affects on success Intranet adoption
Premkumar and Roberts, (1999)	To identify the factors that influence the adoption of new information technologies in small businesses located in rural communities in the US.	Data from 25 organizations were collected using a structured interview process US	Found that TMS is an important determinant of IT adoption.

2.6 Research Contribution

Through the previous literature review the researcher noticed that the contribution of this research is a unique one, being one of the few studies that investigate the influence factors on DSS adoption in general and in Jordan particularly. On the other hand, a large number of previous research has investigated factors affecting IT and IS adoption.

The importance of this research emerges from the fact that it covers a variety of factors that can affect successful DSS adoption, which are: system characteristics, technical aspects, and organizational aspects.

Also from the researcher's point of view and based on the magnitude of this variable (Interoperability) to the research in the context of ASEZA, and it's relevant adherence with a private study conducted by ASEZA itself concerning this variable, the researcher believes that this research added a new variable to the scientific research field of DSS adoption or any IT and IS adoption process.

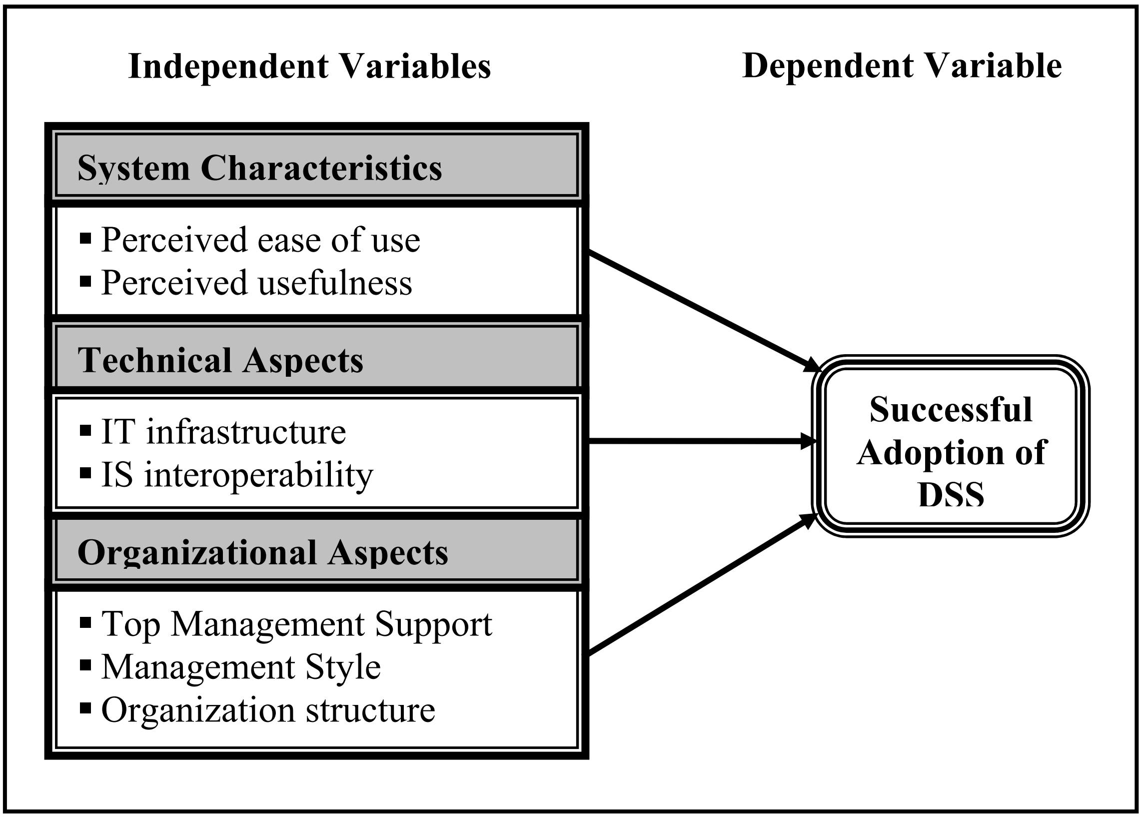
In light of the above theoretical framework and previous studies, the next section provides an outline of the proposed research model, the research hypotheses and operational definitions of the research variables.

2.7 Research Model

To study the main factors influencing successful adoption of DSS, the researcher relies on previous studies, the TAM model and his observations in building the proposed model below.

The dependent variable in this research is the successful adoption of DSS's, while the independent variables are divided into four important categories of factors. First are the System Characteristics, including PEOU, PU derived from the TAM model. Second, concerns Technical Aspects including IT infrastructure, IS Interoperability. Third concerns Organizational Aspects constructed of TMS, MS, and OS derived from the previous studies. The final concerns Demographic Characteristics, including (gender; age; educational level; commission; job description and experience).

Figure (2.9)
The Proposed Model of the Research



2.8 Research Hypotheses

To examine the strength of the model shown in Figure (2.9), the researcher proposes the following null hypotheses:

H01: There is no statistical significant impact for system's characteristics on the successful adoption of DSS within the context of ASEZA.

H0 $_{(1.1)}$ There is no statistical significant impact for the system's PEOU on the successful adoption of DSS within the context of ASEZA.

H0 $_{(1.2)}$ There is no statistical significant impact for the System's PU on the successful adoption of DSS within the context of ASEZA.

H02: There is no statistical significant impact for technical characteristics on the successful adoption of DSS within the context of ASEZA.

H0 $_{(2.1)}$ There is no statistical significant impact for the IT infrastructure on the successful adoption of DSS within the context of ASEZA.

H0 $_{(2.2)}$ There is no statistical significant impact for IS interoperability on the successful adoption of DSS within the context of ASEZA.

H03: There is no statistical significant impact for organizational aspects on the successful adoption of DSS within the context of ASEZA.

H0 $_{(3.1)}$ There is no statistical significant impact for the TMS on the successful adoption of DSS within the context of ASEZA.

H0 $_{(3.2)}$ There is no statistical significant impact for MS on the successful adoption of DSS within the context of ASEZA.

H0 $_{(3.3)}$ There is no statistical significant impact for OS, on the successful adoption of DSS within the context of ASEZA.

H04: There are no significant statistical differences in respondents' perceptions toward DSS adoption that are attributed to demographic characteristics within the context ASEZA.

H0 $_{(4.1)}$ There are no significant statistical differences between respondents' perceptions concerning the adoption of DSS according to their gender.

H0 $_{(4.2)}$ There are no significant statistical differences between respondents' perceptions concerning the adoption of DSS according to their age.

H0 $_{(4.3)}$ There are no significant statistical differences between respondents' perceptions concerning the adoption of DSS according to their education level.

H0 $_{(4.4)}$ There are no significant statistical differences between respondents' perceptions concerning the adoption of DSS according to their commission.

H0 $_{(4.5)}$ There are no significant statistical differences between respondents' perceptions concerning the adoption of DSS according to their job description.

H0 $_{(4.6)}$ There are no significant statistical differences between respondents' perceptions concerning the adoption of DSS according to their experience.

2.9 Operational Definitions

Table (2.5) presents research variables operational definitions, the sources of adopted items and their classification according to their appearance in the research survey.

Table (2.5)
Variables Operational Definitions

Variables	Operational Definition	Sources	Items
Independent Variables			
1. System Characteristics			
1.1 PEOU	The degree to which a manager believes that using a DSS system would be free of effort in ASEZA.	Rigopoulos et al, (2008) Davis, (1989).	1-4
1.2 PU	The degree to which a manager believes that using a DSS system would enhance his or her job performance in ASEZA.	Rigopoulos et al, (2008) Davis, (1989).	5-9
662.Technical Aspects			
2.1 IT infrastructure	The adequacy level of technology component performance that enables DSS adoption. This would cover hardware, software, systems, and communications available in ASEZA's IT Infrastructure.	Benamati and Lederer, (2008) Byrd and Turner, (2000).	10-14
2.2 IS interoperability	The interplay of human systems, business process, diverse systems to work together and enabling technologies to exchange information throughout ASEZA.	Chituc et al, (2008) Stegwee and Rukanova (2003); IEEE, (1990).	15-18
3. Organizational Aspects			
3.1 TMS	The level of influence that the chief executive officer (CEO) practices to support DSS adoption in ASEZA.	Ngai et al, (2008) Elbeltagi et al, (2005).	19-21
3.2 MS	The way in which the management tends to influence, coordinate, and direct people's activities towards ASEZA's objectives.	Rezaei et al, (2009); Hussein et al, (2007).	22-26
3.3 OS	The interaction level among members at all levels among all departments and teams in ASEZA is necessary for successful adoption of DSS.	Shaukat and Zafar (2010) Liu and Bei (2007).	27-30
Dependent Variable			
Success adoption of DSS	The DSS adoption is due to the extent of available group from main factors which are PEOU, PU, IT infrastructure, IS interoperability, TMS, MS, and OS of ASEZA.	Hart and Jaques, (2005) Hart and Porter, (2004).	31-37

Summary

At the end of this chapter, the researcher presents the theoretical framework and previous studies related to DSS, and based on these; the research model and hypotheses are developed. In the next chapter, the researcher discusses the methodology applied for undertaking this research.

Chapter Three
Design and Methodology

3.1 Introduction

The main aim of this chapter is to discuss the methodology that was applied when undertaking this research. This chapter is divided into six main sections. These sections include: research design, research strategy, population and sampling design, data collection methods, analysis tools, and validity and reliability tests.

3.2 Research Design

The selected methodology must be in line with the research objectives and be able to answer the relevant research questions. Consequently, in order to select an appropriate methodology, the aim and objectives of the research should be identified.

The researcher uses a deductive approach which is more likely to work with quantitative data in order to answer the questions about relationships among measured variables with the purpose of explaining, predicting and controlling phenomena. Thus, the aim of a deductive approach is to generalize from a sample to a population (Leedy and Ormrod, 2001).

A deductive approach was deemed to be most appropriate because information being gathered from this type of research enables the researcher to answer research questions and research objectives, identify the main factors, and depict the influence of these factors on the successful adoption of DSS (Zikmund, 2003). This research takes a deductive approach, since the objective is to test specific hypotheses and examine relationships rather than generate new theories and understandings.

The design was quantitative because the data took a numerical form. That is, by employing a deductive approach with a quantitative research method, the researcher has been able to measure and analyze the relationship between influencing factors and the successful adoption of DSS. This approach also allows for testing the research hypotheses and generalizing the research findings to the population (Zikmund, 2003).

The methodological approach in this research is a descriptive one, because the researcher attempts to identify, explain variables of this research and to describe the relationships between these variables in order to provide a picture of a particular phenomenon, but not to ferret out cause-effect relationships (Churchill and Iacobucci, 2002).

The literature of DSS, as reported earlier in Section (2.2), enables the researcher to define a theoretical framework and to develop

hypotheses. Bearing the research objectives, this can be classified in terms of their purposes as descriptive.

3.3 Research Strategy

Research strategy, as defined by Saunders et al, (2003: p.488), is a "general plan of how the researcher will go about answering the research question(s)". Saunders et al, (2003) classified research strategies into six categories as: experiment, survey, case study, grounded theory, ethnography and action research.

Survey strategy involves the structured collection of data from a sizable population (Saunders et al, 2003). By way of illustration, adopting the deductive approach leads the researcher to employ the survey strategies (Sekaran, 2006).

According to Yin (1994) there is one main reason for using the survey strategy, which other strategies cannot provide. For example, a number of the research questions in this study are related to who, what, when, where, how many or how much, and to what extent. These are appropriate for surveys, while the question type using how and why are suitable for a *case study* (Yin, 1994). The nature of questions in this research being investigated, for instance is "What are the main factors that influence the successful adoption of DSS in ASEZA"? And according to the previous study it is appropriate to use a survey-based research approach.

For this research, survey strategy was chosen, and this can yield the following advantages:

The survey strategy is flexible, useful for the discovery of new insights as well as for pointing out typical responses, can be applied to many people and provides data about the present, and about what people are thinking, doing and anticipating (Zikmund, 2003).

3.4 The Population and Sampling Method

3.4.1 The Research Population

The research population exclusively includes ASEZA, which consists of five commissions and 24 directorates as explained in the ASEZA OS appearing in Appendix (III), where each commission is managed by one commissioner; all are supervised by the chief of commissions.

The researcher provides some reasons behind selecting ASEZA as a research population to complete the requirements of this research. The rationale of this choice is threefold:

1. ASEZA was established in 2001 as a bold economic initiative by the government of Jordan, a liberalized, low tax, duty-free and multi–sector

development zone, therefore the researcher selected it due to its large capacity and economical weight.

2. ASEZA offers multiple investment opportunities in a strategic location on the Red Sea; it is considered a global competitive investor that is friendly to the environment and optimizes the efficient utilization of resources; it is an autonomous institution, both financially and administratively, that is responsible for the management, regulation and development of the zone; it presents strategic decisions that affect the area enormously; and its need for support for these decisions through DSS adoption. Therefore, the researcher has selected it.
3. ASEZA is considered as one of the biggest and leading private public sectors` integration entities in the area, where the business units are unique and the only ones operating on such scale with over 2582 employees, a budget of millions of JD's, and relatively big IT infrastructures.

These factors enhanced the researcher and motivated him to conduct the research with confidence and reliability, as it meets the expected scale of research and presents a useful research material, in addition to the high reliability during conducting his research on realistic basis as he has no geographical barriers or administrative ones.

The researcher chose DSS in ASEZA because he found the perfect opportunity to research step by step along with ASEZA to explore the factors of a successful DSS starting from the adoption stage all the way to evaluating its success.

3.4.2 Sample Selection and Sample Size

The procedure of selecting (204) managers (Top and Middle levels) in ASEZA was based on the convenience sampling method, as it is considered the best way of getting some basic information quickly and efficiently (Sekaran, 2006). In addition, the researcher considered this procedure for its compatibility with the distinctiveness of DSS for the managers.

The researcher distributed (204) questionnaires, (161) questionnaires were returned and were valid for analysis; these questionnaires were distributed to all of ASEZA's top and middle management managers. Table (3.1) provides the detailed data regarding the numbers of managers for each commission, heads of departments, unit supervisors and others (which included a number of employees of different job descriptions like, engineers and technical experts, based on the internal records within the context.

Table (3.1)
Number of Managers for Each Commission

Commissions	Manager	Head of Department	Unit Supervisor	
Infrastructure and Services	4	15	22	
Administrative and Financial	7	26	10	
Investment	6	17	1	
Environmental	6	11	0	
Customs and Revenue	2	45	26	
Total	**25**	**114**	**59**	**=198**
		Commissioner **(5)** plus **one** chief of commissioners		**6**
			Sample Size	**204**

Source: internal records within ASEZA

3.5 Data Collection Methods

This field research adopts survey methodology and utilized questionnaires for data collection. This method was used to assess the respondents' characteristics towards the adoption of DSS. This research depends on two main sources of data:

1. Primary data: collected by distribution of questionnaires designed to capture research variables and then analyzing these data using the SPSS software.

   For this research, the use of questionnaire directly fits to the objectives of the research. Saunders et al, (2003) strongly recommended the use of questionnaires for descriptive or explanatory objectives. Consequently, the rationale for using the questionnaire method is that the questionnaire could provide that information relatively quickly*;* given that the selected sample was a representative one.

2. Secondary data: by reviewing relevant books, previous studies and periodicals, as well as websites and databases related to the subject of the research.

3.5.1 Questionnaire Construction

The researcher developed the questionnaire in accordance with the research primary model described previously as well as in previous studies. The consequence, a draft questionnaire has been created, and it was necessary to subject it to a rigorous validation process. The questionnaire was submitted to a Jury of instructors and experts in the faculty of business administration in Mu'tah University, University of Jordan, and Al-Hussein Bin Talal University, and a group of 5 managers in ASEZA (shown the Appendix (VI): Judiciary Group).

The questionnaire is divided into two sections. The first section covers demographic information (gender, age, educational level, commission, job description, and experience). The second section contains (37) items measuring the successful adoption of DSS and the affecting factors: (PEOU, PU, IT infrastructure, IS interoperability, TMS, MS, and OS).

The five-point Likert scale was employed in order to explore the managerial views regarding different issues, which range from (1) 'strongly disagree' to (5) 'strongly agree'. The reason for adopting this scale is to give some degree of choice flexibility to reflect the intensity of respondents' views.

Likert scales were used in the second section of the questionnaire to obtain the information. A five-point scale used to test the (PEOU, PU, IT infrastructure, IS interoperability, TMS, MS, and OS) that can impact the successful adoption of DSS. The scales were translated back and forth from English in order to ensure that they represented the same meaning in Arabic. The translators were fluent in both English and Arabic.

3.5.2 Response Rate

The research population consists of (204) managers in ASEZA. The questionnaires were then directly distributed to them by hand on March-2011. However, according to the Neuman (2000) formula to calculate response rate, the total response rate, as shown in the equations below, is (79) percent. Either total response rate or active response rate, however, it is 'high' and 'adequate' to carry out the data analysis, as suggested by Saunders et al, (2003: p.284).

$$Total\ response\ rate = \frac{Total\ number\ of\ responses}{Total\ number\ in\ sample}$$

$$= \frac{161}{204} = 79\ \%$$

However, a total of forty-three respondents did not respond on account of the reasons listed in Table (3.2). The non-responses were attributed to: (1) a desire to participate but did not return the questionnaires (34.88 %); (2) work load (30.23 %); (3) a firm's policy which deters participation in any academic research (20.93 %); and (4) apology with no reasons (13.95 %).

Table (3.2)
Reasons for Not Responding

Reasons	Non-respondents (N = 43)	
	N	%
• Did not return the questionnaires	15	34.88
• Busy / work load	13	30.23
• Firm's policy not releasing information	9	20.93
• Apology, with no reasons	6	13.95
Total	43	100

3.6 Data Analysis Tools and Techniques

For data analysis, the researcher used the **Statistical Package for Social Science** (SPSS.16). To test the hypotheses of the research, the following data analysis methods were used:

1. Correlation of item-to-total for testing the validity.
2. *Cronbach's Alpha* for internal consistency to verify the stability of the research variables.
3. Descriptive statistics to describe the characteristics of the research sample.
4. Variance Inflation Factor (VIF) and test of variation allowed (Tolerance) to ensure the absence of a high multi-collinearity between the independent variables.
5. Skewness test to ensure that the data follow the normal distribution.
6. Multiple Regression Analysis to test the validity of the research model as well as the impact of the independent variables on the dependent variable.
7. In addition, Independent sample t-test, one-way ANOVA to determine if there is a relationship between a categorical independent variables and a continuous dependent variable, where each subject is only in one level of the independent variables.

3.7 Validity and Reliability Test

Testing Goodness of data by checking for the validity and reliability of measures can be used to ensure the quality of findings and conclusions. Validity and reliability are separated but closely related concepts. Thus, to ensure the precise and accurate instruments developed for this research, it was necessary to have procedures for testing the goodness of data for measurements. There are two criteria for testing the goodness of measures: validity and reliability (Sekaran, 2006).

3.7.1 Validity

According to Zikmund, (2003), validity means "the ability of a scale to measure what was intended to be measured". Some studies went on further in research of validity. Sekaran (2006) suggested that several types of validity tests for testing the goodness of measures include content validity, criterion-related validity, and construct validity. However, this research only included content validity and construct validity.

3.7.1.1 Content Validity

Content validity or face validity is the first type used within this research. It is a method to evaluate the validity of an instrument by the judgment of a group of experts in order to ensure that the questionnaire has an adequate and representative group of questions that reflect the real meaning of the concept (Zikmund, 2003 and Sekaran, 2006).

In this research, the content validity of the survey questionnaire was considered because it was tested by means of a pre-test using research professionals and managers in the context of ASEZA, as described earlier in Section (3.5.1). The participants were asked to comment on the format and appropriateness of questions, and to suggest any items that they believed should be included in the instrument.

3.7.1.2 Construct Validity

Construct validity is another type used for an assessment of the questionnaires capability to record data that accurately reflects the theory upon which the questionnaire is based on (Sekaran, 2006). In other words, construct validity testified that the instrument did tap the concept as theorized. Thus, this measure of validity refers to developing correct and adequate operational measures for the concept being tested (Yin, 1994).

For the purpose of this research, construct validity has been assessed by using correlation analysis, the result of testing the validity showed in Table (3.3). It implies that items that are indicators of a specific construct should converge or share a high proportion of variance (Hair et al, 2006). In other words, it assesses the degree to which measures of the same concept are correlated, with high correlation indicating that the scale is measuring its intended concept.

Table (3.3)
Test of Construct Validity

Factor	Item	Sig. (2-tailed)	Correlation of item-to-total
PEOU	PEOU 1	.000	0.801 **
	PEOU 2	.000	0.821 **
	PEOU 3	.000	0.754**
	PEOU 4	.000	0.691**
PU	PU 1	.000	0.802 **
	PU 2	.000	0.806 **
	PU 3	.000	0.803 **
	PU 4	.000	0.802**
	PU 5	.000	0.736**
IT infrastructure	IT infrastructure 1	.000	0.843 **
	IT infrastructure 2	.000	0.790 **
	IT infrastructure 3	.000	0.753**
	IT infrastructure 4	.000	0.795**
	IT infrastructure 5	.000	0.737**
IS interoperability	IS interoperability 1	.000	0.699 **
	IS interoperability 2	.000	0.748**
	IS interoperability 3	.000	0.708**
	IS interoperability 4	.000	0.639**
TMS	TMS 1	.000	0.873 **
	TMS 2	.000	0.918 **
	TMS 3	.000	0.915 **
MS	MS 1	.000	0.804 **
	MS 2	.000	0.848 **
	MS 3	.000	0.823 **
	MS 4	.000	0.819**
	MS 5	.000	0.562**
OS	OS 1	.000	0.827 **
	OS 2	.000	0.672**
	OS 3	.000	0.747 **
	OS 4	.000	0.577**
Successful Adoption of DSS	DSS adopt 1	.000	0.571 **
	DSS adopt 2	.000	0.592 **
	DSS adopt 3	.000	0.685 **
	DSS adopt 4	.000	0.675 **
	DSS adopt 5	.000	0.633 **
	DSS adopt 6	.000	0.644 **
	DSS adopt 7	.000	0.654 **

** Correlation is significant at the 0.01 level (2-tailed).

The item-to-total correlations in this research all exceed (0.5) and all items were significant because (Sig= .000<0.01); with each dimension

demonstrating properties of good validity, the fitness of these models can now be assessed.

3.7.2 Reliability

Reliability "is the degree to which test measures are free from error and therefore, yield consistent results over time and across situations" (Zikmund, 2003). Reliability can be assessed on two dimensions; repeatability and internal consistency reliability.

Reliability scores are expressed numerically as a coefficient. A coefficient score will be 1.00 if a test is perfectly reliable. A high coefficient of at least .70 is required to indicate an acceptable degree of reliability (Baumgartner et al, 2002). The reliability of the scales was established by utilizing Cronbach's alpha (Table 3.4). Considering the present research as a whole, Cronbach's alpha varied from (0.64 - 0.89), which is considered acceptable for this type of research.

Table (3.4)
Cronbach's Alpha for the Scales

Variables	No. of Cases	No. of items	Cronbach's alpha
PEOU	161	1-4	.77
PU	161	5-9	.85
IT infrastructure	161	10-14	.84
IS interoperability	161	15-18	.64
TMS	161	19-21	.89
MS	161	22-26	.83
OS	161	27-30	.67
Successful adoption of DSS	161	31-37	.71

Summary

In sum, the research methodology has been designed under a deductive quantitative approach based on analyzing data gathered mainly by survey, covering research variables, in order to insight the relationship between the independent variables (PEOU, PU, IT infrastructure, IS interoperability, TMS, MS, and OS) and their ability to explain the variance in the dependent variable (the successful adoption of DSS). This relationship was analyzed using SPSS (version. 16). The response rate was sufficient to perform the research; a recommended sample size of (161). Reliability and validity of measures of motivational factors for the adoption of DSS have been described and satisfied as well as accepted. In the next chapter the researcher discusses the characteristics of the samples background, demographics of the respondents and hypotheses testing.

Chapter Four
Data Analysis and Hypotheses Testing

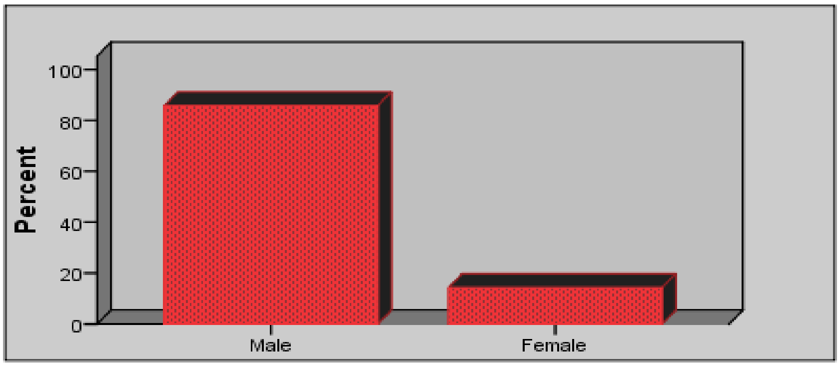
4.1 Introduction

This chapter discusses the characteristics of the sample's background and demographics of the respondents. The researcher verified there are no multi-co linearity problems between the variables included in the model, and tested the normality distribution for the collected data; hypotheses were tested by a multiple regression analysis.

4.2 Sample Characteristics

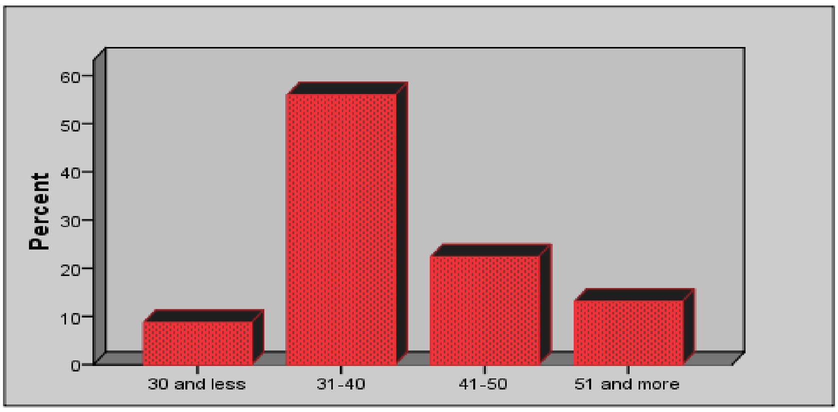
This section describes the sample of the study showing the frequencies and percentages of respondents according to their demographic variables (gender, age, education level, commission, job description, and experience).

Figure (4.1)
Percentages of respondents according to their gender



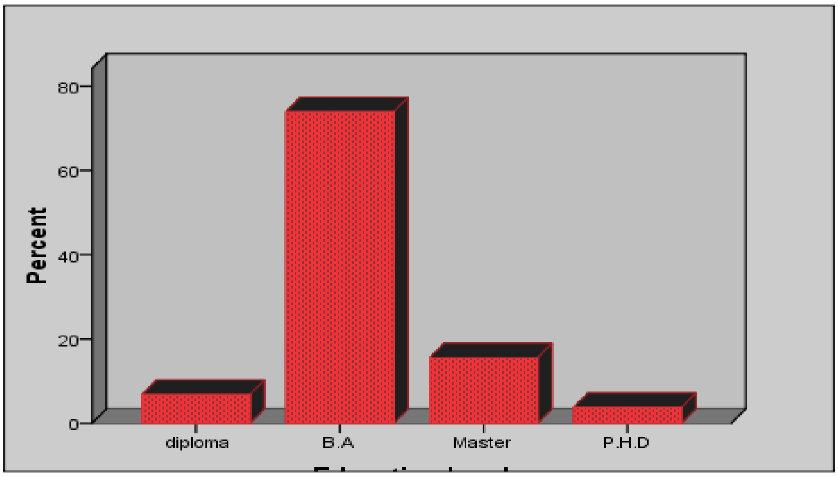
As shown in Figure (4.1), 85.7% of respondents were males, and 14.3% were females. As it's shown, the largest percentages of respondents were males.

Figure (4.2)
Percentages of respondents according to their age



According to the age, Figure (4.2) shows that 8.7% of respondents were of the age range of 30 and less, meanwhile, 55.9% of the respondents were between 31-40 years old, and 22.4% of respondents were of the age range from 41-50 years old. Finally, 13% of the respondents were 51 years and more. Thus, the largest percentage of the sample was those respondents from 31-40 years old, because of the young Jordanian society, and usually in this stage of age range respondents are more motivated and technology oriented.

Figure (4.3)
Percentages of respondents according to their education level



As shown in Figure (4.3), 6.5% of respondents have a College diplomas degree, the B.A holders among the total sample were 73.9%, followed by Master degree 15.5%, and lastly 3.7% have PhD's. Thus, it is evident that the highest percentage of respondents was those with B.A degrees, whereas the lowest percentage of respondents was those who have P.H.D's.

Figure (4.4)
Percentages of respondents according to their commission

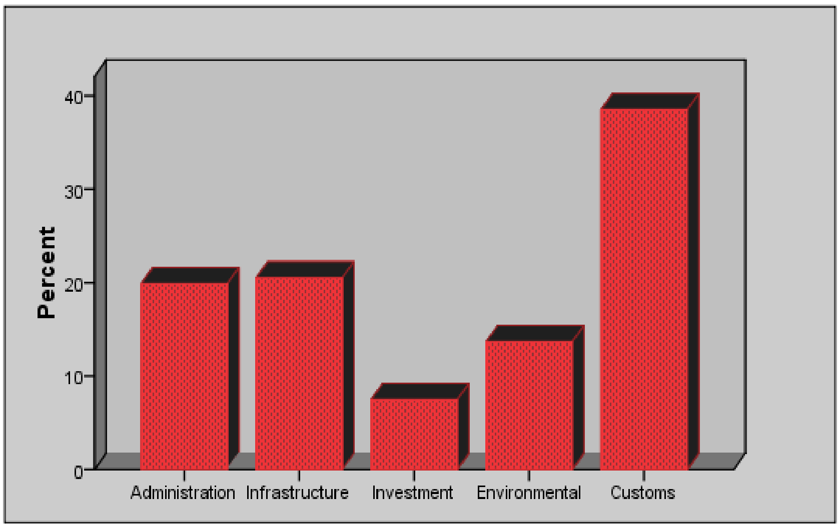


Figure (4.4) indicates that 19.9% of the respondents are from the administration commission. While, 20.5% of respondents are of infrastructure commission, 7.5% of respondents are from investment commissions, and 20.5% of them are environmental commission. Finally, 38.5% of respondents are from the customs commission. It is evident that the highest percentage of the respondents were from those who work at the customs commission, because customs is the biggest commission, and is considered to be one of the most necessary and required commission for the DSS, due to its importance and its work load (consistency and accuracy).

Figure (4.5)
Percentages of respondents according to their job description

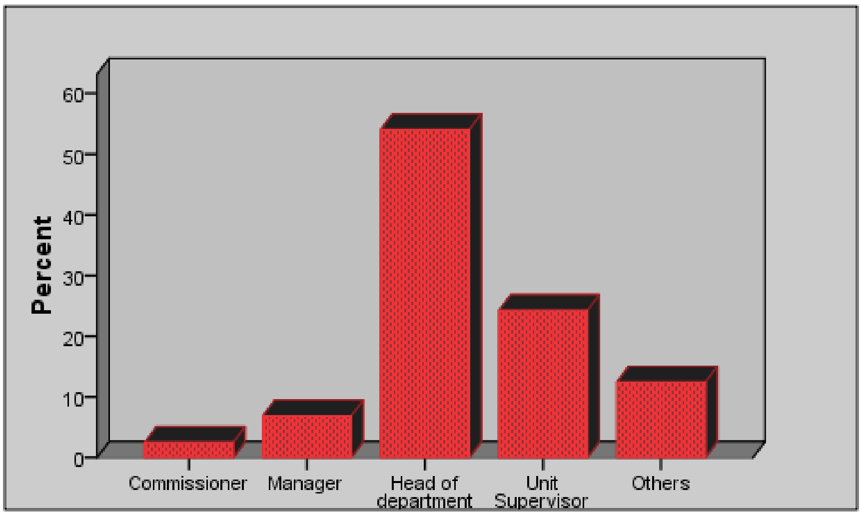


Figure (4.5) shows that 2.5% of the respondents were commissioners. Whereas, 6.8% were managers, 54% were heads of departments, 24.2% were unit supervisors, and finally, 12.4% of them were none of the above. Hence, the largest number of respondents was that of heads of departments and the lowest number of respondents was that of commissioners.

Figure (4.6)
Percentages of respondents according to their experience

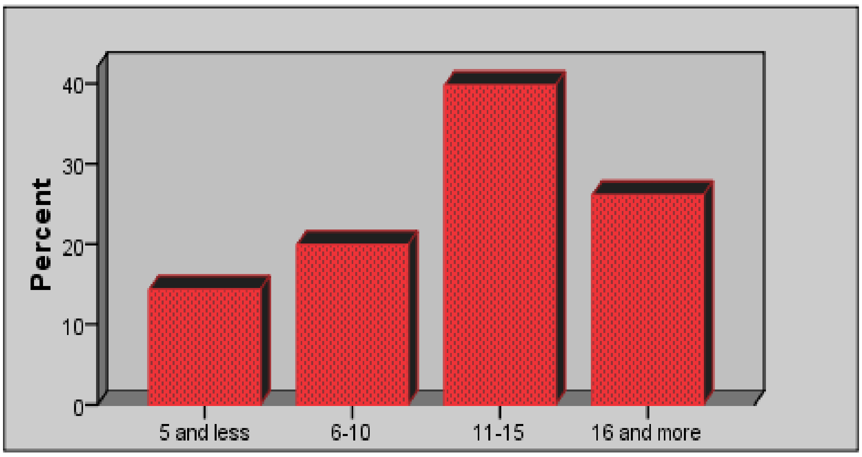


Figure (4.6) indicates that 14.3% of respondents had 30 years experience and less, while, 19.9% of the respondents had an experience that ranged from 6-10 years, 39.8% of them had an experience that ranged from 11-15 years, and finally, 26.1% of respondents were 16 years and of more experience. Thus, the largest percentage was those respondents with experience from 11-15 years who are well experienced and professional in their field, whereas of the lowest percentage was those who have 5 years or less of experience.

4.3 Multiple Regression Analysis

As a large number of variables (eight independent and dependent variables) were measured in this research, and as all of the proposed relationships (hypotheses) were not complicated and they were tested one at a time, it was deemed appropriate to use *multiple regression* estimations for testing the proposed hypotheses (Cheung, 2001; Hair et al, 1998). To test multiple regression models, it is necessary to assess whether the collected data violate some key assumptions of regression models because any assumption violations can result in distorted and biased research results (Hair et al, 1998). These assumptions include Multi-collinearity, Normality and Auto-correlation:

Multicollinearity Test

To analyze Multi-collinearity, two types of measurements can be used: Variation Inflation Factor (VIF) and Tolerance. The VIF, measures the extent the variance of the estimated regression coefficients are inflated as a result of being related to the other independent variables, and Tolerance is the amount of variability of the selected independent variables not explained by other independent variables.

High degrees of Multi-collinearity can result in both regression coefficients being inaccurately estimated, and difficulties in separating the influence of the individual variables on the dependent variables. Any variables with a VIF value above (10) or with a value below (0.10) of tolerance would have a correlation of more than 0.90 with other variables, indicative of the Multi-collinearity problem (Hair et al, 1998).

Results in Table below (4.1) shows that VIF for all independent variables ranged between (1.109 - 2.063), which are less than the limited valued (10) and Tolerance for all independent variables ranged between (.485 - .901), which are greater than (0.10). This indicates that there was no high correlation among the independent variables (Multi-collinearity).

Table (4.1)
The Multicollinearity Test

Variables	Tolerance	VIF
PEOU	.901	1.109
PU	.787	1.271
IT infrastructure	.701	1.427
IS interoperability	.663	1.508
TMS	.580	1.723
MS	.485	2.063
OS	.560	1.787

Normality

Normality occurs when the shape of the data distribution for the variables varies considerably from the normal distribution. This violation may result in achieving invalid statistical results. The data were checked to verify that the assumption of multivariate normality was met. In a strict definition of a normal distribution, the Skewness of the data would equal zero. In a practical sense, normality is defined as "a range of scores that span either side of zero" (Hair et al, 1998).

The ratio of Skewness to its standard error can be used as a test of normality (that is, you can reject normality if the ratio is less than -2 or greater than +2). A large positive value for Skewness indicates a long right tail; an extreme negative value indicates a long left tail" (SPSS Base 16.0 users Guide, 2007: p.276). Table (4.2) presents the Skewness normality distribution test:

Table (4.2)
Skewness Coefficients

Variable	Skewness
PEOU	-.122
PU	-.423
IT infrastructure	-1.353
IS interoperability	-.530
TMS	-.689
MS	-.319
OS	-.264
Successful adoption of DSS	-.256

The reading of the *Skewness* test findings, all variables are normally distributed, ranging from (-1.353 to -.122) falling within the interval of (2,-2).

Fitness of the Model: the linear regression analysis of the original model reveals that the R-square of the model is 0.352. This means that the model explains 35.2% of the variance in the dependent variable as shown in Table (4.3) below. The model is statistically significant, as the p-value for the model is 0.000 which is less than the limit for statistical significance limit in same Table, which is 0.10 for weak significance and 0.05 for significance. This level is good; meaning that the fitness of the model in explaining the adoption process is high.

Table (4.3)
Fitness of the Model for Regression Analysis

Model Summary [b]

Mode	R	R Square	Adjusted R Square	S.D Error of the Estimate	Durbin-Watson	F	Sig.
1	.593[a]	.352	.322	.35148	2.037	11.877	.000

a. **Predictors**: (Constant), OS, IT infrastructure, PEOU, PU, TMS, IS interoperability, MS.
b. **Dependent Variable**: successful adoption of DSS.
* Statistically significant at the level of significance ($\alpha \leq 0.05$)

Auto- correlation

Auto- correlation measured through Durbin-Watson test statistic, this test is one of the most widely used tests for auto-correlation in regression models (Jeong and Chung, 2001). This test needs to approximately equal 2, as showed in Table (4.3) that Durbin Watson is 2.037, so the problem of auto-correlation does not exist.

4.4 Hypotheses Testing

After confirming that the assumptions of regression models were met, this section deals with hypotheses testing. The hypotheses were tested using multiple regression analysis and (t-test), to know if there is an impact of independent variables (System Characteristics, Technical Aspects, and Organizational Aspects) on (Successful Adoption of DSS) as the dependent variable, according to the Decision rule: "accept" the null hypothesis (H0) if calculated value (t-calculated) is less than tabulated value (t-tabulated) and "reject" (H0) if calculated value is greater than tabulated value. Also, "0.05" level of significance was used to analyze the collected data. According to the Decision rule: "accept" null hypothesis (H0) if the significance level (α) of the question is greater than 0.05 significance level, and "reject" (H0) if the significance (α) level equals or is less than 0.05 (Berenson and Levine, 1999). As a result for this decision rule, the researcher has tested statistically the proposed hypothesis and found the following results:

Hypotheses (1-3): There is no statistical significant impact for (system's characteristics, technical aspects and organizational aspects) on successful DSS's adoption within the context of ASEZA.

Table (4.4)
T-Value and Significance Level (α)
Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	S.D Error	Beta		
(Constant)	1.854	.308		6.011	.000
PEOU	.041	.039	.072	1.049	.296
PU	.224	.060	.272	3.709	.000
IT infrastructure	.300	.060	.392	5.039	.000
IS interoperability	.010	.069	.011	.143	.886
TMS	-.016	.040	-.035	-.411	.682
MS	-.001	.051	-.002	-.022	.983
OS	.042	.047	.077	.889	.376

a. **Dependent Variable**: Successful adoption of DSS

Statistically significant at the level of significance ($\alpha \leq 0.05$)

From the results showed in Table (4.4), PEOU has a non-significant direct effect on successful adoption of DSS in ASEZA (t = 1.049; sig = .296). While PU has a significant direct impact on the successful adoption of DSS in ASEZA (t = 3.709; sig = .000). Furthermore, IT infrastructure has
a significant direct impact on the successful adoption of DSS in ASEZA (t = 5.039; sig = 0.000).

IS interoperability has no significant direct impact on the successful adoption of DSS in ASEZA (t = .143; sig = .886). TMS has a non-significant direct effect on the successful adoption of DSS in ASEZA (t = -.411; sig = .682).

In addition, the results indicated that MS has a non-significant direct effect on the successful adoption of DSS in ASEZA (t = -.022-; sig = .983). OS has a non-significant direct effect on the successful adoption of DSS in ASEZA (t = .889; sig = .376). Table (4.5) summarizes the results of hypotheses testing using Multiple Regression.

Table (4.5)
Summary of the Results of Hypotheses Testing (1-3)

Null Hypothesis	t	Sig	Accept / Reject at %5 level
H01: There is no statistical significant impact for *system's characteristics* on successful DSS's adoption within the context of ASEZA.			
H0 $_{(1.1)}$ There is no statistical significant impact for the system's *PEOU* on DSS's adoption within the context of ASEZA.	**1.049**	**0.29**	**Accept H0**
H0 $_{(1.2)}$ There is no statistical significant impact for the System's *PU* on DSS's adoption within the context of ASEZA.	**3.709**	**0.00**	**Reject H0**
H02: There is no statistical significant impact for *technical aspects* on successful DSS's adoption within the context of ASEZA.			
H0 $_{(2.1)}$ There is no statistical significant impact for the *IT infrastructure* on DSS's adoption within the context of ASEZA.	**5.039**	**0.00**	**Reject H0**
H0 $_{(2.2)}$ There is no statistical significant impact for *IS interoperability* on DSS's adoption within the context of ASEZA.	**.143**	**.886**	**Accept H0**
H03: There is no statistical significant impact for *organizational aspects* on successful DSS's adoption within the context of ASEZA.			
H0 $_{(3.1)}$ There is no statistical significant impact for the *TMS* on DSS's adoption within the context of ASEZA.	**-.411**	**.682**	**Accept H0**
H0 $_{(3.2)}$ There is no statistical significant impact for *MS* on DSS's adoption within the context of ASEZA.	**-.022**	**.983**	**Accept H0**
H0 $_{(3.3)}$ There is no statistical significant impact for *OS* on DSS's adoption within the context of ASEZA.	**.889**	**.376**	**Accept H0**

After performing the regression analysis to examine the factors influence on the successful adoption of DSS, the researcher measured the

differences among the respondent's perceptions toward adopting DSS based on the demographic characteristics by testing the fourth hypothesis:

H04: There are no significant statistical differences between respondents' perceptions toward DSS adoption according to their demographic characteristics in the context ASEZA.

Table (4.6)
Level of Significance of the User Gender and the Adoption of DSS

		Levene's Test for Equality of Variance		t-test for equality of Means		
		F	**Sig**	**T**	**df**	**Sig (2-tailed)**
Adoption of DSS	**Equal variance assumed**	2.035	.156	-.827	159	.409
	Equal variance not assumed			-.905	32.185	.372

Statistically significant at the level of significance (α≤ 0.05)

Table (4.7)
Level of Significance of the Age, Education Level, Commission, Job Description, and Experience toward the Adoption of DSS

Demographic Characteristics		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Age	Between Groups	12.680	12	1.057	1.631	.089
	Within Groups	95.879	148	.648		
	Total	108.559	160			
Education level	Between Groups	2.385	12	.199	.551	.878
	Within Groups	53.416	148	.361		
	Total	**55.801**	**160**			
Commission	Between Groups	38.051	12	3.171	1.241	.260
	Within Groups	378.036	148	2.554		
	Total	**416.087**	**160**			
Job description	Between Groups	7.123	12	.594	.754	.696
	Within Groups	116.516	148	.787		
	Total	**123.640**	**160**			
Experience	Between Groups	16.419	12	1.368	1.431	.158
	Within Groups	141.531	148	.956		
	Total	**157.950**	**160**			

Statistically significant at the level of significance (α≤ 0.05)

Based on the results shown in Table (4.6), T-test analysis (Independent Sample t-test) was used to test if there is no significant

statistical difference between respondent's perceptions towards adoption of DSS according to the *gender*. Result showed a (f = 2.035; Sig = .156) for gender.

Table (4.7), ANOVA was used to test if there is no significant statistical difference between respondents perceptions towards the adoption of DSS according to the Age, Education level, commission, Job description, and Experience (see Table 4.13). Results showed a (f = 1.631; sig = .089) for age, has (f = .551; sig = .878) for Education level, has (f = 1.241; sig = .260) for Commission, has (f = .754; sig = .696) for Job description, and has (f = 1.431; sig = .158) for *Experience*. Thus, (H04) was accepted. And therefore, it was found that there is no significant statistical difference between respondent's perceptions towards DSS adoption in terms of their (gender, Age, Education level commission, Job description, Experience). Table (4.8) summarizes the results of hypotheses testing using t-test and ANOVA methods.

Table (4.8)
Results of Testing Hypothesis (4)

Null Hypothesis 4	F	Sig	Accept / Reject at %5 level
H04: There are no significant statistical differences between respondent's perceptions and adoption of DSS according to their *demographic characteristics.*			
H0 $_{(4.1)}$ There are no significant statistical differences between respondent's perceptions and adoption of DSS according to their *gender*.	-.827	.409	**Accept H0**
H0 $_{(4.2)}$ There are no significant statistical differences between respondent's perceptions and adoption of DSS according to their *age*.	1.631	.089	**Accept H0**
H0 $_{(4.3)}$ There are no significant statistical differences between respondent's perceptions and adoption of DSS according to their *education level*.	.551	.878	**Accept H0**
H0 $_{(4.4)}$ There are no significant statistical differences between respondent's perceptions and adoption of DSS according to their *commission*.	1.241	.260	**Accept H0**
H0 $_{(4.5)}$ There are no significant statistical differences between respondent's perceptions and adoption of DSS according to their *job description*.	.754	.696	**Accept H0**
H0 $_{(4.6)}$ There are no significant statistical differences between respondent's perceptions and adoption of DSS according to their *experience*.	1.431	.158	**Accept H0**

Summary

This chapter has presented and described the demographic characteristics of the research samples along with information concerning the respondents' profiles and the hypotheses testing with no problem

regarding the multi-collinearity. Skewness scores of the data indicated an approximately normal distribution and no Auto-correlation problem based on the Durbin-Watson test. The next chapter provides a brief discussion of the findings and conclusions based on the research objectives regarding the factors affecting the successful adoption of DSS. Also, it will present the recommendations and limitations of the research.

Chapter Five
Conclusions and Recommendations

5.1 Introduction

This chapter is concerned with presenting the findings, discussions and conclusions of the research based on the objectives and the hypotheses testing. Also, it will present the recommendations and limitations of the research.

5.2 Discussion of the Findings

The research findings indicated that managers in ASEZA appear to make their successful DSS adoption based on its PU and IT infrastructure. These results are somewhat consistent with the findings of previous studies. In light of the research objectives and the hypotheses testing in chapter four the researcher has revealed the following overall conclusions:

5.2.1 System Characteristics

Perceived Ease of Use

The research accepted H01.1. This is due to the fact that ASEZA has not fully applied the DSS yet and also the respondents see that the system's PEOU does not have any affect on the successful adoption of DSS. In contrast, Rigopoulos et al, (2008) found that PEOU have positive effects on DSS adoption. However, in this research, the researcher found that PEOU has no effect on the successful adoption of DSS within the context of ASEZA.

Perceived Usefulness

The researcher found that PU has a positive affect on the successful adoption of DSS in ASEZA, due to the respondents' awareness of DSS's importance as it will facilitate the managerial decision making process, hence H01.2 is rejected. These findings are similar to the results of many previous studies, such as the studies of (Chan, 2009; Rigopoulos et al, 2008; Elbeltagi et al, 2005).

5.2.2 Technical Aspects

IT infrastructure

Through examining the H02.1, the researcher found that IT infrastructure has a positive role in the successful adoption of DSS in the context of ASEZA, hence this H02.1 is rejected. The researcher believes that this result is the consequence of the orientation of ASEZA toward technology. ASEZA strives to build strong technical environment in order to operate a new system such as DSS. This finding is similar to the results arrived at by Benamati and Lederer (2008) who found that successful DSS

depend on an IT infrastructure that gathers, stores, and provides appropriate information.

IS Interoperability

The researcher found that IS interoperability has no effect on the successful adoption of DSS in ASEZA hence H02.2 is accepted. The researcher believes that this result is due to the simple knowledge regarding the term *Interoperability* for the (non-technical departments respondents). On the other hand, the IT department had a deep understanding of the term. Never the less, no effect was found due to the respondent's magnitude of the other departments over the IT department.

5.2.3 Organizational Aspects

Top Management Support

The researcher found that TMS has no effect on the successful adoption of DSS in ASEZA, hence H03.1 is accepted, and this result is related to the respondents' personal opinions as individuals regarding ASEZA's top management policies. However, It is indicated severally in research literature that TMS is a key factor affecting the adoption of new IT and has the greatest effect on DSS usage, it would also help the employees to overcome resistance and facilitate acceptance of new IS applications adoption, implementation or utilization (Ngai et al, 2008; Hussein et al, 2007; Elbeltagi et al, 2005; Nathan et al, 2004; Ang et al, 2001).

Management Style

The researcher found that MS has no effect on the successful adoption of DSS in ASEZA, hence H03.2 is accepted. The researcher believes that the respondents see that MS has no affect on successful adoption of DSS regardless of style (People and Task Oriented Styles). On the contrary, Rezaei et al, (2009) and Hussein et al, (2007) found that MS has the highest predictor of IS success. People-oriented MS is more prevalent than task-oriented MS. This outcome is due to the state where users are more comfortable towards a people-oriented style and managers giving emphasis on inter-personal relationships. This is partially supported by Lu and Wang's (1997) research, which asserted the significance of people-oriented style in the earlier stages to system.

Organizational Structure

The researcher found that OS has no effect on the successful adoption of DSS in ASEZA, hence H03.3 is accepted, and this result can be justified by the respondents point of view that the heterogeneous OS of ASEZA contains different departments, sections and teams with divergent responsibilities and authorities, and it is not properly aligned for implementation of a new technology. However, several studies have found that OS is necessary for the successful introduction of new technology

adoption and it is an important factor to be considered when implementing any technology (Shaukat and Zafar, 2010; Liu and Bei, 2007).

5.2.4 Demographic Variables

The researcher found no significant statistical differences in the respondents' perceptions toward DSS adoption that can be attributed to demographic characteristics within the context of ASEZA, hence H04 is accepted. This is attributed to the fact that all respondents are motivated towards any new technology, such as DSS, that would help with their job tasks, regardless of their demographic characteristics. This finding, however, isn't consistent with Liu and Chen (2008) and Masrek et al, (2007) who found individual differences toward the acceptance of DSS.

5.3 Conclusions of the Research

In light of the research objectives and empirical results, and in order to answer the research questions outlined at the beginning of this research, the researcher has reached the following as overall conclusions:

1. PU and IT infrastructure have a positive effect on the successful adoption of DSS in the context of ASEZA.
2. The remaining factors (PEOU, IS interoperability, TMS, MS, OS, and demographic characteristics) have no effect on the successful adoption of DSS in the context of ASEZA.
3. ASEZA has a very strong base of IT infrastructure that is capable of adopting DSS, but based on the respondents point of view; ASEZA's top Management does not have enough organizational transparency to clarify the long term (strategic) goals of adopting such systems leaving managers in confusion.
4. The researcher noticed that there is not enough communication between the top management and the managerial departments and therefore the respondents did not find any clear and obvious role for the top management towards the adoption of DSS.
5. ASEZA's managers share a collective opinion regarding accepting DSS as a new system using new technologies, and this is considered as a rare case especially in a big organization of ASEZA's scale and with varied demographic characteristics.

5.4 Recommendations of the Research

In light of the research results and conclusions the researcher recommends that:

1. ASEZA must maintain the actual level of orientation towards technology and clarify the purposes of its adoption as a helping tool and not a replacement for these managers. It should also keep a consistent rate of growth and development for the IT infrastructure, because of its

big importance as an investment for ASEZA and its positive effect on the successful adoption of DSS in the context of ASEZA.

2. ASEZA must pay more attention to the organizational aspects represented in TMS, MS, OS towards adopting and DSS, and would have to clarify the strategic purposes and goals of using such systems through comprehensive and continuous trainings and workshops for the employees using this system (Top and Middle Management Level Managers) rather than classifying such procedures as organizational secrecy issues based on the conclusion stating the lack of communication between top management and the managerial departments.

5.5 Future Research

In light of the research results and conclusions the researcher proposes several recommendations for future research, as follows:

1. This research has tested certain factors and did not take into consideration other factors that can also have an effect on successful adoption of DSS such as: the internal policies and regulation of an organization, the organization culture, the changed management style of the organization. However, these factors were not identified until this research findings were out.
2. This research was conducted only for ASEZA as a limited sample, and it would be even of greater use if it is applied into a comparative frame of research and a bigger scale of organization.
3. This research investigates the impact of a set of factors on DSS's adoption. However, future research can make an evaluation of the implementation of this system based on cost and profit rules.
4. Future research should study the factors that reinforce the success of DSS *Use* rather than the successful *Adoption* only.

5.6 Limitations of the Research

This research has a number of limitations that should be taken into account when evaluating and generalizing its conclusions. However, the limitations discussed below can provide the starting point for future research:

1. In this research the researcher used a single method in data collection (questionnaires) to test a number of hypothesized relationships.
2. At the end of this research the researcher faced some difficulties in some departments due to the organizational change that ASEZA was and is still going through, especially in the delay of questionnaire's collection stage, as most of the managers were busy in meetings on constantly changing work policies because of the changes in the top management.

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Appendix (I)
ASEZA Commissions

ASEZA Commissions

Commission/Section or Directorate	No.
Land, Infrastructure and Services/ Physical Planning	**1.1**
Land, Infrastructure and Services/ Municipal Services and Public Works	**1.2**
Land, Infrastructure and Services/ Real Estate Management / Land and Property management	**1.3**
Land, Infrastructure and Services/ Building Permits and Inspection	**1.4**
Investment and Economic Development / Investment Promotion	**2.1**
Investment and Economic Development / Investment Services	**2.2**
Administration and Finance / Administration	**3.1**
Administration and Finance / Finance	**3.2**
Customs and Revenue / Revenue	**4.1**
Customs and Revenue / Customs	**4.2**
Environmental Regulation and Enforcement / Environmental Planning	**5.1**
Environmental Regulation and Enforcement / Environmental Compliance	**5.2**
Environmental Regulation and Enforcement / Environment and Health Control	**5.2**

Source: (ASEZA, 2002)

Appendix (II)
ASEZA Information Systems and Sub-Systems

ASEZA Information Systems and Sub-Systems

Major System Name	Sys. No.	Sub-System Names	Main Owner
ASEZA Planning GIS System	1A	Physical Planning and Land Information GIS System	1.1
ASEZA Planning GIS System	1B	GIS/Aqaba Cadastral Maps and Land Ownership System	1.1
Aqaba Land Transaction and Ownership Tracking System	2.1	ASEZA-Owned Land Transactions History Details	1.1
Design Guidelines and Building Regulations System	10		1.1
GIS/Municipal Services And Building Inspection Management System	3.1	GIS/ Municipal Services Scheduling and Planning System	1.2
GIS/Municipal Services And Building Inspection Management System	3.2	GIS/ Inspection Rounds Schedule and Follow Up	1.2
GIS/Municipal Services And Building Inspection Management System	3.3	GIS/Solid Waste Collection Planning and Schedule	1.2
GIS/Municipal Services And Building Inspection Management System	3.4	GIS/Animals/Pest Control Planning and Scheduling	1.2
GIS/Municipal Services And Building Inspection Management System	3.5	GIS/Infrastructure Maintenance Planning and Scheduling	1.2
Engineering/Services Management System	4.1	Tenders Management System	1.2
Engineering/Services Management System	4.2	Engineering/Services Contracts Management System	1.2
Engineering/Services Management System	4.3	Engineering Work Orders Management System	1.2
Facility Management and Maintenance Services System	5.1	GIS/ Facility Management Preventive Maintenance System	1.2
Facility Management and Maintenance Services System	5.2	GIS/ Maintenance Scheduling and Follow Up System	1.2
Aqaba Land Transaction and Ownership Tracking System	2.2	Privately-owned Land Transactions History Details	1.3
Aqaba Land Transaction and Ownership Tracking System	2.3	Privately-Owned Land Ownership Tracking System	1.3
ASEZA Facilities Monitoring System	7.1	ASEZA Facilities Investment Portfolio Management System	1.3
ASEZA Facilities Monitoring System	7.2	ASEZA Rented Facilities Information System	1.3
ASEZA Facilities Monitoring System	7.3	ASEZA-owned Facilities Information and Management System	1.3
ASEZA Land Investment Contracts Portfolio Management System	9		1.3
Investment Opportunities Management System	8		1.3 & 2.1

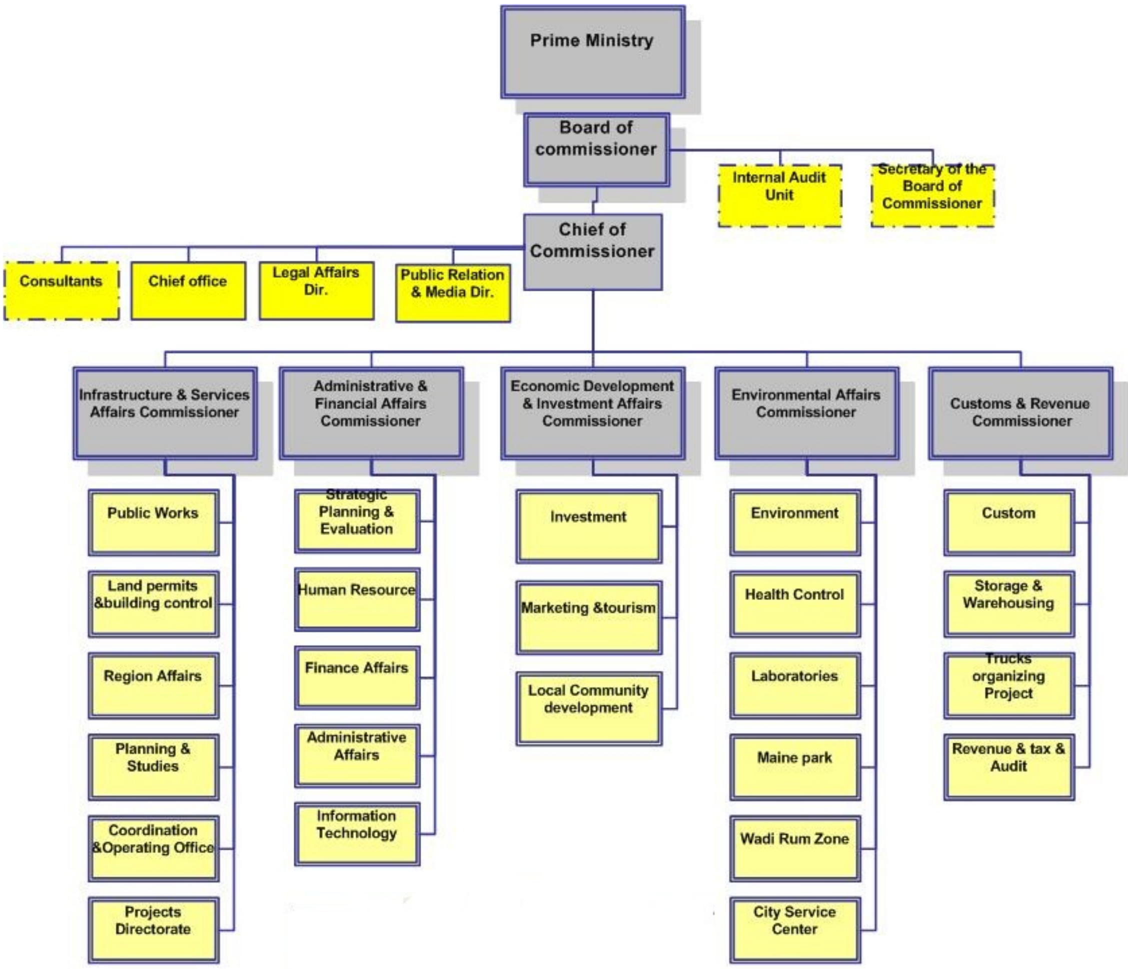
Design Review and Building Permits and Fees Management System	11		1.4
Investment Queries Management System	29		2.1
Investment Tracking and Resolutions System	30		2.1
ASEZA Monitoring and Evaluation System	35.2		2.1
ASEZA Monitoring and Evaluation System	35.1		2.1
Investment Facilitation and Permitting Management System	31		2.2
Business Registration Management System	32		2.2
Residency and Work Permit Management System	33		2.2
ASEZA Technical Standards System	34.1		2.2
Inspection Results and Violation Management Sub-System	6		2.2
Vehicles/Equipment Management System	14		3.1
ASEZA Personnel and HRD System	15		3.1
ASEZA Personnel and HRD System	15.1	HRD and Recruitment Management System	3.1
ASEZA Personnel and HRD System	15.2	HRD and Training Management System	3.1
ASEZA Personnel and HRD System	15.3	HRD and Personnel System	3.1
ASEZA Library and Reference System	23		3.1
ASEZA Library and Reference System	23.1	Library Management System	3.1
ASEZA Library and Reference System	23.2	Library Electronic Reference System - Web Based	3.1
Correspondence Control System	24		3.1
Document Archiving System	25		3.1
ASEZA Procedures Management System	27		3.1
Telephone Exchange System	28		3.1
Telephone Exchange System	28.2	Contact Management System	3.1
Telephone Exchange System	28.1	Telephone Monitoring System	3.1
Stores Management System	12.1	Fixed Assets and Warranties System	3.2
Stores Management System	12.2	Inventory Control Management System	3.2
Stores Management System	12.3	Holdings Management System	3.2
Procurement System	13		3.2
Payroll System	16		3.2
ASEZA Financial Systems	17.1	Accounts Payables	3.2
ASEZA Financial Systems	17.2	Accounts Receivables	3.2
ASEZA Financial Systems	17.3	Financial Notifications	3.2

		Management System	
ASEZA Financial Systems	17.4	Fixed Assets Depreciation System	3.2
ASEZA Financial Systems	17.5	General Ledger	3.2
ASEZA Financial Systems	17.6	Letters of Guarantees Management System	3.2
ASEZA Financial Systems	17.7	Budget Management System	3.2
Payment Reconciliation System	18		3.2
Sales Tax Management System	19		4.1
Income Tax Management System	20		4.1
Customs Audit and Enforcement System	21		4.2
ASYCUDA	22		4.2
ASEZA Technical Standards System	34.2		5.1
ASEZA Technical Standards System	34.3		5.1
GIS/ Environmental Inspection Scheduling and Monitoring System	36		5.1
Environmental Studies & Monitoring System	37.1		5.1
Environmental Studies & Monitoring System	37.2		5.1
EIA and Environmental TOR References System	38		5.1
Consumer Protection Management System	39		5.2
Natural Reserves Management System	40		5.2
Food Control Management System	41		5.3
Work Flow and Document Management Systems	42		MIS
ASEZA Laws and Regulations References System	26		MIS/ Legal Affairs

Source: (ASEZA, 2002)

Appendix (III)
ASEZA Organizational Structure

ASEZA Organizational Structure



Source: www.aseza.jo

Appendix (IV)
Questionnaire* English Version

Mu'tah University
Faculty of business administration
MBA program

Dear managers,

The purpose of this research is to collect information concerning your opinions about factors influencing successful adoption of Decision Support Systems (DSS). The usefulness of this questionnaire depends entirely on your honesty, candor, and care with which you respond to each of the questions. All information you provide will be anonymous and confidential. Finally, I would like to offer my sincere thanks to your participation and contribution to this study.

Your answers will be treated in strict secrecy and the information will be used for academic research purposes only.

Researcher
Malek. B. Eleyan

Part (1): User Characteristics

Gender: ☐ Male ☐ Female

Age:

☐ 30 year and less ☐31-40 year
☐ 41 - 50 year ☐ 51 year and more

Educational Level:

☐ College Diploma degree ☐ Bachelor's degree
☐ Master's degree ☐ Doctoral degree

Commission:

☐ Administration ☐ Infrastructure
☐ Investment ☐ Environmental
☐ Customs

Job Description:

☐ Commissioner ☐ Manager
☐ Head of department ☐Unit supervisor
☐ Others

Experience:

☐ 5 years and less ☐ 6-10 years
☐ 11-15 years ☐16 years and more

Part (2): For the following questions, please put down ✓which best describes your opinion.

No.	Item	Scale				
Systems characteristics						
1. Perceived Ease of Use (PEOU)						
1.	I think that the use of DSS do not require a lot of mental effort.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
2.	I think that dealing with DSS does not need courses and intensive training programs.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
3.	I think that the use of DSS do not require a lot of time to give results.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
4.	I think that DSS are characterized by ease of interaction and dealing with it.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
2. Perceived usefulness(PU)						
5.	I think that the use of DSS can make decisions faster.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
6.	I think that the use of DSS can reduce administrative costs in ASEZA.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
7.	I think that the use of DSS is one of the best means to resolve administrative problems.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
8.	I think that the use of DSS increase the productivity of labor.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
9.	I think that the use of DSS facilitate access to information.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
Technical Aspects						
1. Information Technology Infrastructure						
10.	I think that the availability of modern computers in ASEZA lead to the success of DSS adoption.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
11.	I think that the software provides sophisticated systems to help the success of DSS adoption.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
12.	I think that the availability of databases with advanced high-power capacity help in the success of DSS adoption.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □

13.	I think that the availability of a network (Intranet) link between staff within ASEZA help in the success of DSS adoption.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
14.	I think that the availability of network (Internet) that connects between the ASEZA and business partner's abroad help in the success of DSS adoption.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
2. Interoperability of systems						
15.	I think that the visibility and flow of data and information between departments helps in the interoperability of systems.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
16.	I think that the automation of work facilitates the process of interoperability of the regimes in ASEZA.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
17.	I think that the homogeneity of the systems in operation in ASEZA is necessary for the interoperability of the systems.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
18.	I think that the availability of databases developed withclear standards is the major reason for reaching interoperable systems.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
Organizational Aspects						
1. Top management support(TMS)						
19.	I believe that the senior management of ASEZA provides financial support for the success of the adoption of DSS.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
20.	I believe that senior management in ASEZA provides experts in the systems for the construction of a successful DSS.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
21.	I believe that senior management is interested in DSS to its importance in raising the efficiency of ASEZA.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
2. Management Style(MS)						
22.	I believe that senior management is keen on introducing their employees to the DSS, its advantages to them and ASEZA.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □

23.	I believe that the senior management staff informs their employees of all decisions that affect the course of their career and their ability to deal with DSS.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
24.	I believe that the senior management encourages managers to make their proposals on the adoption of DSS.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
25.	I believe that the senior management develops a sense of importance of the adoption of DSS to the users.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
26.	I believe that DSS enable users to solve some administrative problems without the need to return to the senior management.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
3. Organizational structure(OS)						
27.	I think that ASEZA has a flexible organizational structure helps in the success of DSS adoption.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
28.	I think that the presence of a Hierarchy organizational structure reduces the number of managerial levels in ASEZA, which helps in the success of DSS adoption.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
29.	I think that ASEZA has a simple organizational structure helps to determine the Authorities and responsibilities in the use of DSS.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
30.	I think that avoiding the centralization at ASEZA in decision-making help in the success of DSS adoption.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
Successful adoption of DSS						
31.	I think that the success of DSS adoption is due to the extent of acceptance by users in terms of ease of dealing with it.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
32.	I think that the success of DSS adoption is due to the extent of acceptance by users in terms of interest rates offered by ASEZA.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
33.	I think that the success of DSS adoption depends on the availability of Information Technology Infrastructure.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □
34.	I think that the success of DSS adoption requires a presence of a high degree of systems interoperability.	Strongly Agree □	Agree □	Neutral □	Disagree □	Strongly disagree □

35.	I think that the success of DSS adoption depends on the support of senior management.	Strongly Agree ☐	Agree ☐	Neutral ☐	Disagree ☐	Strongly disagree ☐
36.	I think that the success of DSS adoption depends largely on the participation in the process of decision-making at ASEZA.	Strongly Agree ☐	Agree ☐	Neutral ☐	Disagree ☐	Strongly disagree ☐
37.	I think that the success of DSS adoption depends on the flexibility of the organizational structure of ASEZA.	Strongly Agree ☐	Agree ☐	Neutral ☐	Disagree ☐	Strongly disagree ☐

Please write down any comments that may be appropriate for this research:
…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………

"Thank you for your participation"

Appendix (V)
Questionnaire* Arabic Version

جامعة مؤتة

كلية إدارة الأعمال

قسم إدارة الأعمال

عزيزي المدير الكريم:-

تحية طيبة وبعد..

نضع بين أيديكم استبانه خاصة بدراسة (**العوامل المؤثرة في نجاح تبني نظم دعم القرار في سلطة منطقة العقبة الاقتصادية الخاصة**) و تأتي الدراسة استكمالا لمتطلبات الحصول على درجة الماجستير في إدارة الأعمال.

وتتمحور أسئلة الإستبانة حول موضوع نظم دعم القرار(DSS)؛ ويقصد بهـا الأنظمـة المبنية على استخدام الحاسب الهادفة إلى مساعدة متخذي القرارات في عملية اتخاذ القرار وحل المشاكل الإدارية.

لذا نرجو التكرم من حضرتكم التفضل بتعبئة هذه الاستبانة لما لذلك من أثر بـالغ فـي إثراء هذه الدراسة, وعلماً بأن هذه البيانات سوف تستخدم لأغـراض البحـث العلمـي فقـط وستعامل بسرية تامة, وستكون دقة إجاباتكم ومساهمتكم عوناً كبيراً في التوصـل إلـى نتـائج موضوعية وعلمية. وهذا سوف يزودكم الباحث بنتائج الدراسة حين الانتهاء منهـا, إذا رغبـتم بذلك.

وتفضلوا بقبول فائق الاحترام والتقدير

الـباحـث

مــالـك عليـان

Malek.mba@hotmail.com

Tel: 0799199945

الاستبيان الخاص بالدراسة عن
العوامل المؤثرة في نجاح تبني نظم دعم القرار

الجزء الأول: البيانات الشخصية:

أرجو تعبئة البيانات التالية :

1. الجنس: ☐ ذكر ☐ أنثى

2. العمر:

☐30 سنة فأقل ☐31- 40 سنة.

☐41- 50 سنة. ☐ 51 فأكثر.

3. المؤهل العلمي:

☐ دبلوم متوسط ☐ بكالوريوس

☐ ماجستير ☐ دكتوراه

4. المفوضية:

☐ الإدارية والمالية ☐ البنية التحتية والخدمات

☐ البيئة والرقابة الصحية ☐ التنمية الاقتصادية والاستثمار

☐ الإيرادات و الجمارك

5. المسمى الوظيفي

☐ مدير ☐ مفوض

☐ رئيس وحدة ☐رئيس قسم

☐ غير ذلك, الرجاء اذكرها...................

6. الخبرة العملية في المجال الحالي:

☐6- 10 سنوات ☐ 5 سنوات فأقل

☐11- 15 سنة ☐ 16 سنة فأكثر

الجزء الثاني:

فيما يلي مجموعة من العوامل المؤثرة في نجاح تبني نظم دعم القرار، الرجاء وضع إشارة (✓) في المربع الذي يعبر (من وجهة نظرك) عن مدى موافقتك على كل عامل من هذه العوامل.

الرقم	العبـــــارات	التقييم				
المحور الأول: خصائص النظام						
سهولة استخدام نظم دعم القرار						
.1	**أعتقد أن استخدام نظم دعم القرار لا يتطلب الكثير من الجهود الذهنية.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.2	**اعتقد أن التعامل مع نظم دعم القرار لا يحتاج إلى دورات وبرامج تدريبية مكثفة.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.3	**أعتقد أن استخدام نظم دعم القرار لا يتطلب الكثير من الوقت لإعطاء النتائج.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.4	**اعتقد أن نظم دعم القرار تتصف بسهولة التفاعل والتعامل معها.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
الفائدة (الأهمية) من نظم دعم القرار						
.5	**اعتقد أن استخدام نظم دعم القرار يمكن من اتخاذ القرارات بشكل أسرع.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.6	**اعتقد أن استخدام نظم دعم القرار يمكن من تقليل التكاليف الإدارية في السلطة.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.7	**اعتقد أن استخدام نظم دعم القرار يعتبر من أفضل الوسائل لحل المشاكل الإدارية.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.8	**اعتقد أن استخدام نظم دعم القرار يؤدي إلى زيادة إنتاجية العمل.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.9	**اعتقد أن استخدام نظم دعم القرار يسهل الحصول على المعلومات.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
المحور الثاني: الجوانب التقنية						
البنية التحتية لتكنولوجيا المعلومات						
.10	**اعتقد أن توفر أجهزة حاسوب حديثة في السلطة تساعد في نجاح تبني نظم دعم القرار.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.11	**اعتقد أن توفر برمجيات وأنظمة متطورة تساعد في نجاح تبني نظم دعم القرار.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.12	**اعتقد أن توفر قواعد بيانات متطورة ذات طاقة استيعابية عالية تساعد في نجاح تبني نظم دعم القرار.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.13	**اعتقد أن توفر شبكة (Intranet) تربط بين الموظفين داخل السلطة تساعد في نجاح تبني نظم دعم القرار.**	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □

.14	اعتقد أن توفر شبكة (Internet) التي تربط بين السلطة وشركاء العمل في الخارج تساعد في نجاح تبني نظم دعم القرار.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
تكامل عمل الأنظمة						
.15	اعتقد أن وضوح انسياب البيانات و المعلومات بين الأقسام يساعد في تكامل الأنظمة.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.16	اعتقد أن تجانس الأنظمة العاملة في السلطة يعد ضروريا لتكامل عمل الأنظمة.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.17	اعتقد أن توفر قواعد البيانات المطورة حسب معايير واضحة يعد سببا رئيسيا للوصول إلى تكامل الأنظمة.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.18	اعتقد أن أتمتة العمل يسهل عملية التكامل للأنظمة في السلطة.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
المحور الثالث: الجوانب التنظيمية						
دعم الإدارة العليا						
.19	اعتقد أن الإدارة العليا في السلطة توفر الدعم المالي لنجاح تبني نظم دعم القرار.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.20	اعتقد أن الإدارة العليا في السلطة توفر خبراء متخصصين في النظم لقيام ببناء ناجح لنظم دعم القرار.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.21	اعتقد أن الإدارة العليا تهتم بنظم دعم القرار لأهميتها في رفع كفاءة السلطة.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
النمط الإداري						
.22	اعتقد أن الإدارة العليا تحرص على تعريف العاملين لديها بنظم دعم القرار وبيان مزاياها لهم وللسلطة.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.23	اعتقد أن الإدارة العليا تطلع الموظفين على كافة القرارات التي تؤثر في مسار عملهم الوظيفي وقدرتهم على التعامل مع نظم دعم القرار.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.24	اعتقد أن الإدارة العليا تشجع المدراء على إبداء اقتراحاتهم حول تبني نظم دعم القرار.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.25	اعتقد أن الإدارة العليا تنمي الشعور بأهمية تبني نظم دعم القرار لدى مستخدميه.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.26	اعتقد أن نظم دعم القرار تمكن مستخدميه من حل بعض المشاكل الإدارية دون الحاجة للرجوع إلى الإدارة العليا.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
الهيكل التنظيمي						
.27	اعتقد أن السلطة تمتلك هيكل تنظيمي مرن يساعد في نجاح تبني نظم دعم القرار.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □
.28	اعتقد أن وجود هيكل تنظيمي أفقي يقلل من عدد المستويات الإدارية في السلطة مما يساعد في نجاح تبني نظم دعم القرار.	موافق بشدة □	موافق □	محايد □	غير موافق □	غير موافق بشدة □

.29	اعتقد أن السلطة تمتلك هيكل تنظيمي بسيط يساعد في تحديد الصلاحيات والمسؤوليات في استخدام نظم دعم القرار.	موافق بشدة ☐	موافق ☐	محايد ☐	غير موافق ☐	غير موافق بشدة ☐
.30	اعتقد أن تجنب السلطة المركزية في اتخاذ القرار يساعد في نجاح تبني نظم دعم القرار.	موافق بشدة ☐	موافق ☐	محايد ☐	غير موافق ☐	غير موافق بشدة ☐
نجاح تبني نظم دعم القرار						
.31	أعتقد أن نجاح تبني نظم دعم القرار يرجع إلى مدى تقبله من قبل المستخدمين من حيث سهولة التعامل معه.	موافق بشدة ☐	موافق ☐	محايد ☐	غير موافق ☐	غير موافق بشدة ☐
.32	اعتقد أن نجاح تبني نظم دعم القرار يرجع إلى مدى تقبله من قبل المستخدمين من حيث الفائدة التي تقدمها للسلطة.	موافق بشدة ☐	موافق ☐	محايد ☐	غير موافق ☐	غير موافق بشدة ☐
.33	اعتقد أن نجاح تبني نظم دعم القرار يعتمد على توفر البنية التحتية لتكنولوجيا المعلومات.	موافق بشدة ☐	موافق ☐	محايد ☐	غير موافق ☐	غير موافق بشدة ☐
.34	اعتقد أن نجاح تبني نظم دعم القرار يتطلب تواجد درجة عالية من تكامل عمل الأنظمة السائدة.	موافق بشدة ☐	موافق ☐	محايد ☐	غير موافق ☐	غير موافق بشدة ☐
.35	أعتقد أن نجاح تبني نظم دعم القرار يعتمد على مدى دعم الإدارة العليا.	موافق بشدة ☐	موافق ☐	محايد ☐	غير موافق ☐	غير موافق بشدة ☐
.36	أعتقد أن نجاح تبني نظم دعم القرار يعتمد بشكل كبير على المشاركة في عملية اتخاذ القرار في السلطة.	موافق بشدة ☐	موافق ☐	محايد ☐	غير موافق ☐	غير موافق بشدة ☐
.37	أعتقد أن نجاح تبني نظم دعم القرار يعتمد على مدى مرونة الهيكل التنظيمي للسلطة.	موافق بشدة ☐	موافق ☐	محايد ☐	غير موافق ☐	غير موافق بشدة ☐

الرجاء إبداء أي ملاحظات قد تراها مناسبة لهذا البحث:

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شكرا جزيلا لتعاونكم معنا

Appendix (VI)
Judiciary Group

Judiciary Group

1	Prof. Nedal Al- Hawamdeh	Mu'tah University
2	Dr. Medhat Al-Tarawneh	Mu'tah University
3	Dr. Faisal Shawawrah	Mu'tah University
4	Dr. Asa'd Al-Ali	Mu'tah University
5	Dr. Ra'ed. Al-Adaileh	Mu'tah University
6	Dr. Samer AL- Mohammad	Mu'tah University
7	Dr. Hisham Mobaideen	Mu'tah University
8	Dr. Ghazi Abu Ka'ood	Mu'tah University
9	Prof. Saleh Al-Sharay'ah	The University of Jordan
10	Prof. Abbas Al-Rubai'e	The University of Jordan
11	Dr. Mohammed Al-Kilani	Al-Hussein Bin Talal University
12	Prof. So'ud Al- Mahamid	Al-Hussein Bin Talal University
13	Dr. Zaid Al- Shuqierat	Al-Hussein Bin Talal University
14	Dr. Fou'ad Krishan	Al-Hussein Bin Talal University
15	Dr. Adel Al-Khatab	Al-Hussein Bin Talal University
16	Eng. Omar Al-Odeibat	ASEZA
17	Eng. Zeyad Al-Boshete	ASEZA
18	Eng. Sa'ed Al-Mas'od	ASEZA
19	Eng. Ma'en Al-Qatamin	ASEZA